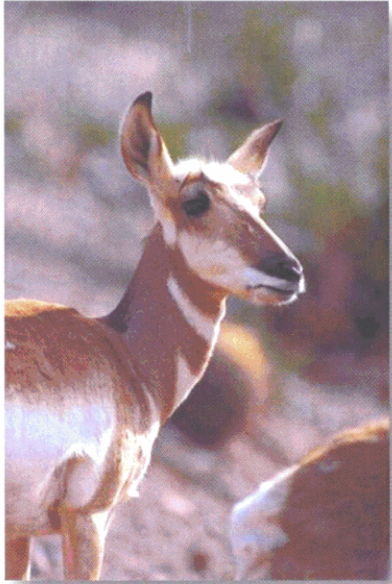


ENVIRONMENTAL ASSESSMENT

**SONORAN PRONGHORN HABITAT
FORAGE ENHANCEMENT**



December 2000

Lead Agency:
US Air Force, Luke Air Force Base

Cooperating Agencies:
US Marine Corps, Marine Corps Air Station Yuma
Arizona Game and Fish Department, Region IV



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ENVIRONMENTAL ASSESSMENT
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I. INTRODUCTION

A. Background

The Sonoran Pronghorn Recovery Implementation Team has identified the need to improve the quality of habitat for the endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) within the Barry M. Goldwater Range.

The Sonoran pronghorn is one of five subspecies of pronghorn and was listed by the U.S. Fish and Wildlife Service (USFWS) as an endangered species in 1967. Sonoran pronghorn occupy the plains of central western Sonora, Mexico, northward into southwestern Arizona (Wright and DeVos 1986). In Arizona, Sonoran pronghorn are found on the Cabeza Prieta National Wildlife Refuge (CPNWR), Organ Pipe Cactus National Monument (OPCNM), the Barry M. Goldwater Range (BMGR), and some adjacent public and State lands, all south of Interstate 8.

Within the last century, the Sonoran pronghorn population has been estimated in the United States to be 105 in 1924, 60 (outside of Organ Pipe Cactus National Monument) in 1941, less than 100 in 1956, less than 50 in 1968, and between 50 and 150 during 1968-1974. Wright and DeVos estimated a population of 85-100 during their study (1983-1985).

More recently, systematic aerial surveys have estimated the population in the United States to be 216 in 1996 and between 132 and 172 individuals in 1998. Currently, fewer than 130 animals are estimated to be in the United States (Bright et al. 1999). These surveys are considered to be more accurate than previous estimates, which were less complete and covered smaller areas. Sonoran pronghorn have extremely large home ranges, averaging 920 km² (Hervert et al. 2000). Large home ranges may suggest an overall low habitat quality (Yoakum 1978).

The historic range of Sonoran pronghorn in both the United States and Mexico has been altered and fragmented by human activities such as the damming and diverting of large rivers for agriculture, construction of highways and fences, livestock grazing, settlement, recreation, and military activities in the United States. These activities, along with climatological and vegetational shifts, have reduced the quantity and quality of habitat available to Sonoran pronghorn, leading to low population levels. Consequently, aggressive management to ameliorate the effects of past human actions and current habitat restrictions on Sonoran pronghorn range is necessary.

Fawn survival is currently the most critical component of the population dynamics of Sonoran pronghorn. Small changes in the recruitment level of fawns can have dramatic influences on population size and the probability of extinction (Hosack 1996). Recently, fawn recruitment has been dangerously low, with no known recruitment in three of the last five years (Hervert et al. 2000). One key to recovery of this endangered subspecies is through improving the recruitment of fawns into the population.

Reproductive success and fawn survival are largely governed by environmental factors, particularly the availability of nutritious forage. Sonoran pronghorn diet has been studied through micro histological analysis of fecal pellets collected from 1994 through 1998. These analyses have shown that forbs and shrubs make up the majority of Sonoran pronghorn diets (Hervert et al. 2000). Forbs are selected when they are available. Browse makes up the main component of their diet when forbs are not available, such as during drought periods. Nutritional analyses indicate that forbs contain

large amounts of protein, as well as being highly digestible and providing preformed water, while shrubs are high in fat (Hughes and Smith 1990, Fox 1997). Numerous studies of pronghorn feeding habits in other parts of the country confirm that nutritious forbs are the most selected forage items for pronghorn when they are available (Beale and Smith 1970, Yoakum 1990).

The availability of preferred food items for pronghorn is dependent on the timing and amount of rainfall. All desert plants respond to moisture input, but annual plants are triggered by rainfall. Normal periods of rainfall in the Sonoran desert follow a bimodal pattern, occurring as convective thundershowers in the summer and long cyclonic storms in the winter. The winter storms are the primary stimulant of plant productivity, much of it in the form of winter ephemeral plant growth (Patten 1978). Adequate winter rains are needed to sustain winter annuals into spring and early summer. This is the time of year when pronghorn does require nutritious forage to meet the high energy demands of lactation and weaned fawns need quality forage for growth.

Additionally, a productive summer monsoon (thunderstorm) season is needed to produce sufficient quantities of summer annuals and promote new growth on perennials. Without this forage, fawns will be unable to maintain body weight and will subsequently die. Summer monsoons also provide ephemeral sources of freestanding water. However, two consecutive productive rainfall seasons are rare in the Sonoran desert.

Sonoran pronghorn use certain areas of the Barry M. Goldwater Range on a more frequent basis than surrounding areas (DeVos 1989, Hervert et al. 1997, 2000). These areas occur within Tactical Ranges that have been disturbed by military activities (High Explosive [HE] Hill, targets, runways), which have resulted in the thinning of creosote and other perennial shrub vegetation, creating a more open habitat, favorable to pronghorn. In addition, the disturbed soil surface, which holds water runoff better than surrounding flat areas, has promoted increased herbaceous plant growth (forbs) preferred by pronghorn. The availability of late-season quality forage as well as freestanding water, which collects in clay-bottomed bomb craters, allow pronghorn to occupy these habitats longer and in larger groups than otherwise expected.

The influence of coyote (*Canis latrans*) predation on Sonoran pronghorn fawns remains largely unstudied. A review of the literature shows that the first 30 days of a fawn's life is the period that they are most vulnerable to coyote predation (Trainer et al. 1983, Ockenfels et al. 1992, Canon 1993). In the Sonoran desert, when spring habitat conditions are good, large numbers of fawns survive the first 90 days, until the onset of summer (Hervert et al. 2000). Predators undoubtedly take pronghorn fawns; however, the available data suggest habitat condition is more influential on fawn mortality rates and improving habitat may result in higher levels of fawn recruitment.

On August 27, 1997, USFWS issued a Biological Opinion to the U.S. Air Force (USAF) (#2-21-96-F-094; "Biological Opinion For the Use of Ground-Surface and Airspace for Military Training on the Barry M. Goldwater Range which May Affect the Endangered Sonoran Pronghorn."). Reasonable and Prudent Measure Number 3 states that "USAF will begin a pilot study to determine if supplemental watering of test plots will increase the amount and length of time forbs are present and if Sonoran pronghorn will be attracted to and use these areas."

The Sonoran Pronghorn Recovery Implementation Team, consisting of representatives from the Arizona Game and Fish Department (AGFD), Luke Air Force Base (LAFB), USFWS, Marine Corps Air Station, Yuma (MCAS), National Park Service (NPS), Bureau of Land Management (BLM), Tohono O'odham Nation, and the Mexican Government, has the responsibility of implementing the Final Revised Sonoran Pronghorn Recovery Plan. Increasing adult and fawn survival through habitat enhancement (including investigation of food plots and water developments) is identified as a recovery action (USFWS 1998, page 38, section 1.2).

The Recovery Implementation Team proposes to enhance habitat by increasing forage for Sonoran pronghorn during the late spring and summer months at 10 locations within the Barry M. Goldwater Range. Free water would also be provided at some of these areas during the time that forage is available.

The Military Lands Withdrawal Act of 1999 (Title XXX of Public Law 106-65) transfers general management authority of the Barry M. Goldwater Range from the BLM to the Air Force and Marine Corps. This environmental assessment was initiated shortly after PL 106-65 was signed into law in October 1999. Preparation of the environmental assessment was a team effort between the AGFD, the Yuma and Phoenix field offices of the BLM, and Luke AFB. These agencies are members of the Sonoran Pronghorn Recovery Implementation Team, and pooled their resources to prepare the environmental assessment.

The lead agencies for this proposed action are the Air Force and Marine Corps; the BLM and AGFD are cooperating agencies. The proposed action is a requirement of a biological opinion issued to the Air Force, hence most of the funds for implementation are provided by Luke AFB. Some of the plots are located on that portion of the Barry M. Goldwater Range managed by the Marine Corps. Furthermore, the Marine Corps may also contribute funds toward implementation of this proposed 7-year study. Therefore, Luke AFB and MCAS Yuma are the lead agencies for decisions regarding the proposed action.

B. Purpose and Need of Proposed Action.

The proposed action is to implement Reasonable and Prudent Measure Number 3 of the 1997 Biological Opinion, by creating areas of high-quality forage for Sonoran pronghorn. These areas would increase the availability of forage and water during the times of the year critical for fawn survival. The project proponents are Luke Air Force Base and Marine Corps Air Station-Yuma as part of an interagency effort supported by the Bureau of Land Management Phoenix and Yuma Field Offices. Arizona Game and Fish Department would conduct the project. The participating agencies may contribute labor and resources in the future as needed.

The action is needed to improve the survival of pronghorn fawns during their first summer. Recruitment of fawns during recent years has been extremely low and thus there are very few “new” adults entering the aging breeding population. Without increased fawn recruitment, there is a high probability that pronghorn numbers will continue to remain at the low levels that have been seen historically over the last century. If the Western drought conditions continue for a sustained period, there is also some possibility that pronghorn numbers may decline towards extinction. The ultimate objective of this proposed project is to increase the population of Sonoran pronghorn to a level sufficient to allow the relocation of some animals for the establishment of additional populations in their historical range. This is one of the primary recovery goals in the Final Revised Sonoran Pronghorn Recovery Plan (USFWS 1998).

The Final Revised Recovery Plan established a goal of 300 adult Sonoran pronghorn in the United States for the subspecies to be considered for downlisting to threatened. Sonoran pronghorn numbers appear to fluctuate with forage conditions, which are, in turn, dependent on rainfall. Other factors previously suspected of keeping Sonoran pronghorn numbers low, such as poaching, are no longer considered significant.

Congress mandated under the Endangered Species Act of 1973, as amended, that all Federal agencies shall seek to conserve endangered species (16 U.S.C. § 1531 (1)). In Sierra Club v. Glickman 156 F.3d 606 (5th Cir. 1998), the Court ruled that all Federal agencies have a duty to use “all methods and

procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.”

As part of this project, the following hypotheses would be tested (see Appendix A - Hypotheses Testing and Monitoring):

1. H_0 : There is no difference in forage production between treated and untreated plots.
 H_a : Forage production is greater on treated plots.
2. H_0 : Sonoran pronghorn use treated (enhanced) areas randomly.
 H_a : Sonoran pronghorn use treated areas more than expected.
3. H_0 : Sonoran pronghorn fawn survival is not influenced by the combination of habitat manipulations (creosote removal, forage enhancement and free standing water).
 H_a : Sonoran pronghorn fawn survival is influenced by the combination of habitat manipulations.
4. H_0 : Diet of Sonoran pronghorn is not influenced by enhancement of forage.
 H_a : Diet of Sonoran pronghorn is influenced by enhancement of forage.
5. H_0 : Predation of Sonoran pronghorn is not influenced by the combination of habitat manipulations (creosote removal, forage enhancement and freestanding water).
 H_a : Predation of Sonoran pronghorn is not adversely influenced by habitat manipulations.

C Conformance with Land Use Plan. The proposed action would be in conformance with the *Yuma District Resource Management Plan*, approved in February 1987, and the *Lower Gila South Resource Management Plan-Goldwater Amendment*, which was approved in November 1990. This is BLM’s overall planning guidance for natural and cultural resource management of the Barry M. Goldwater Range.

D Relationships to Other Plans. This action is consistent with BLM’s *Fish and Wildlife 2000 Plan*. The proposed project lies, in part, within the coverage of the *Lechuguilla-Mohawk Habitat Management Plan*, a cooperative AGFD/BLM document that was completed in October 1997. The proposed action is also consistent with the draft *Barry M Goldwater East Habitat Management Plan*.

This proposed action is consistent with and required of LAFB’s final Biological Opinion, dated August 27, 1997. The creation of forage enhancement plots for Sonoran pronghorn is described under Reasonable and Prudent Measure Number 3 in the Biological Opinion. In addition, this proposed action is consistent with the Final Revised Sonoran Pronghorn Recovery Plan (USFWS 1998).

The forage enhancement project would also help to meet the AGFD’s Wildlife 2000 Strategic Plan (1996-2000). Wildlife 2000 calls for AGFD to work cooperatively with land managers and landowners to improve habitat conditions through water developments and other habitat enhancement methods.

II. PROPOSED ACTION AND ALTERNATIVES

A. Alternative A - Proposed Action.

The proposed action is to grow native annual and perennial forage for pronghorn in 10 areas on the Barry M. Goldwater Range beginning in fall 2000 (See Table 1 and Figure 1). The forage would be available during the spring and summer months when pronghorn fawn mortality is the highest. Adult pronghorn require about 2.5 pounds of forage per day (Lee et al. 1998), and plentiful forage is very important to young fawns soon after weaning.

This approach, of growing additional forage and providing freestanding water, is being used successfully on the endangered peninsular pronghorn (*Antilocapra americana peninsularis*) in Baja, Mexico (Cancino et al. 2000, Giralda et al. 2000). With the increased nutrition, one doe gave birth to triplets this year in Mexico (Jorge Cancino, pers. comm. 2000)

The 10 proposed plots were selected from areas the Sonoran pronghorn have repeatedly used during the last five years, documented using radio-telemetry data. The plots are also in areas of sandy soils, which are more conducive to forage growth and persistence. Tevis (1958a) found that the onset of wilting and drying of ephemeral forage was delayed two weeks in areas of sandy dunes compared to adjacent flats with heavier soils.

The approach is to duplicate conditions existing within the South Tactical Range (STAC) on the Barry M. Goldwater Range where there has been disturbance of soil and vegetation along roads, in the vicinity of bomb targets, and in particular around a small volcanic hill known as HE Hill. Sonoran pronghorn are attracted to HE Hill to take advantage of the improved forage conditions and periodic free water that is available there.

A total of 1,983 acres (8.03 km²) within the Barry M. Goldwater Range may be affected by this project. Eight of the 10 plots are 1 square kilometer in size (247 acres)[100 hectares], which is the size of the preferred areas used by pronghorn on the STAC. Two of the 10 plots would be strips 500 meters long by approximately 30 meters wide (0.015 km²) and would be located adjacent and parallel to existing roads.

Within each plot, a combination of habitat manipulation strategies would occur based on the characteristics of the site and logistics:

Creosote Removal. Creosote (*Larrea tridentata*) shrubs would be thinned on the plots. A hand-carried propane torch would be used to selectively burn individual plants. No heavy equipment would be used. Brown and Minnich (1986) found that creosote is poorly adapted to relatively low intensity fire as evidenced by limited sprouting and reproduction following burning.

The thinning of the creosote would reduce plant competition for water (both rainfall and artificial water), allow additional forb production, as well as increase openness. Creosote would not be removed along desert washes or on desert pavement terraces. Creosote would not be removed in areas where they are already sparse. Creosote shrubs, which have other species of perennial plants growing within their base, would not be burned. Creosote would only be thinned in areas with sandy soils. In order to reduce visual impacts, no creosote shrubs would be removed within 100 feet of existing roads. Where cultural resources are found, no creosote shrubs would be removed within a buffer area, the size of which would be determined by an archeologist. See Figure 2 for an example of how the different project components would be arranged on the plots.

Irrigation Wells. After obtaining appropriate well permits from the Arizona Department of Water Resources, three irrigation wells would be installed in the vicinity of the plots. While the depth to groundwater is unknown in the vicinity of the plots, based on established wells in other parts of the

aquifer, is estimated to lie less than 400 feet below the ground surface (BGS). Ground water could be encountered in the Dateland area at 150-200 feet BGS or less, and well yields of 150-200 gallons/minute are possible. Ground water in the vicinity of the plots could be encountered at depths less than 100 feet, but the clayey gravels above compacted clayey gravels or hard pan, that are likely to be the water source, would produce highly variable yields. Water quantity (well production) and quality, including salinity and heavy metals, would be tested to establish suitability before use. Each well would serve two or three of the plots. One well would serve Mohawk Pass and Mohawk Dune plots, one would serve the three Granite Mountain plots, and one would serve the Point of the Pintas plots. Well yields in the vicinity of the plots could vary from less than 10 gallons/minute to the, unlikely, maximum of 150-200 gallons per minute. In either case, such yields would not support the volume necessary to spray-irrigate a 1.8-acre plot and an appropriately sized storage tank would be required. The hardware at each well site would include the wellhead, a water storage tank and whatever piping, pumps, power sources and associated equipment are stored onsite between irrigation episodes.

Water Truck. The three Aztec Hills plots would be served by water trucks hauling the water from the nearest canal or other appropriate water source. Water would be stored at each of the plots, using aboveground storage tanks. Water would then be pumped from the storage tanks to the aboveground sprinkler system. Preliminary permission to pump water from the Wellton-Mohawk Irrigation and Drainage canals has been granted.

Water Sprinkler Application. The water would be pumped from the ground using a submersible pump and delivered to each of the plots using a PVC pipe system. A trailer-mounted generator would be used to power the submersible pumps. An aboveground sprinkler system would be used to apply water to the plots. This method of irrigation would produce a light spray of water, which would deeply penetrate the soil. This would also reduce soil erosion from water runoff and would prevent seeds/seedlings from being washed out of the soil. During the winter months, a total of approximately five inches of water (simulating five inches of rain) would be sprinkled onto each plot. Water would be applied in the fall beginning when night temperatures drop below 70° F. This water would be sufficient to encourage the germination and growth of winter annuals. Desert soils contain an adequate seed bank to support germination of a variety of plants. The plants would be sustained into the late spring and early summer with periodic applications of additional water.

The irrigated area would be approximately 7,500 square meters in size (1.85 acres) per plot. A total of 18.5 acres would be watered on the 10 plots combined. To improve the germination of seeds already present in the soil, the ground surface would be lightly raked to a depth of approximately one inch (2.5 cm) by hand using a garden rake prior to the first application of water. Irrigation would generally be accomplished at night when evaporative loss would be minimized and pronghorn would be the least likely to be disturbed. Human disturbance would not take place when pronghorn are present.

Water would be applied frequently enough to keep the annual plants alive as long as possible while pronghorn are in the area or until summer rains relieve the need for watering. Initially, the soil would be kept moist for 14 to 21 days until the seeds that are in the soil germinate. Watering will taper off during the winter to about once/month after the seeds have established. Watering may become more frequent in May/June when temperatures rise and humidity drops to keep the plants alive. In the summer, most annual plants would go to seed and die even if the watering continues. Continued watering would maintain the growth of perennial plants and grasses. This germination and watering strategy was recommended by Michelle Rauscher of the Desert Botanical Garden in Phoenix; Kim Baker of the Arizona Sonoran Desert Museum in Tucson; and Rita Anthony, horticulturist with Wild Seed.

Given ample rains from late season storms, vegetative and reproductive growth of annual plants can continue for extended periods, and some annuals can "perennate" and live for two years (Forseth et

al. 1984). Tevis (1958) found that when two inches of water was sprinkled on a dying population of mature ephemeral plants, all living individuals revived completely and resumed extensive growth and flowering.

Native seeding. If there are areas within the sprinkled plots where natural germination has not produced enough forage, seeding could be used. Seeds of native plants would be hand collected locally (on the Barry M. Goldwater Range). No seeds would be purchased. A garden rake would be used to produce a favorable seedbed, seeds would be applied by hand, and the sprinkling of water continued. Native seeds could be collected from: desert marigold (*Baileya* spp.), globemallow *Sphaeralcea* spp.), buckwheat (*Eriogonum* spp.) or other herbaceous forage. Seeding would not take place outside of the area where water was being applied by sprinkling.

The water system would encourage the growth and increase the moisture content of native perennials such as wire lettuce (*Stephanomeria* spp.), silverbush *Argythamnia* [*Ditaxis*] spp.), and range ratany (*Krameria grayi*). These plants are common within the plots. These perennial plants sustain pronghorn when annual forage is not available, and given additional water they would remain green and more palatable for longer periods.

Freestanding water. Freestanding water assists pronghorn in digesting high-protein forage. It is known that pronghorn can go without freestanding water when forage succulence is about 70% water (Beale and Smith 1970). However, in hot weather, even if forage succulence is above average, fawn survival is negatively affected by a lack of water (Beale and Holmgren 1975). At five of the forage enhancement plots (Mohawk Pass, Mohawk Dune, Granite Mountains #1, Aztec Hills #1, and Point of the Pintas #1), a temporary supply of free-standing water would be available to pronghorn during the times that pronghorn are using the plots and water is beneficial for fawn survival. The water would be stored underground in a single length of buried PVC pipe, 24 inches in diameter and 21 feet in length (See Figure 3). The pipe would have a capacity of 490 gallons. The pipe would be filled with well water delivered through a smaller pipe and would be connected to a 30 inch-deep walk-in drinker. The entire system would be buried 30 inches in the ground. There would be a valve between the PVC pipe and the walk-in trough allowing the system to be turned off.

Camping/Staging Areas. Participants in the burning, well installation, sprinkler set-up and temporary water placement would camp at or near the project sites, which would be expected to take three to four days for each site (See Appendix B - Anticipated Work Schedule). A campsite/staging area would be designated and marked with survey flagging in order to minimize the impact of vehicles and human trampling. The campsite/staging areas would be convenient to each proposed project plot or group of plots. Previously disturbed sites would be used, if available. If more than five participants are expected, a portable chemical toilet (port-a-pottie) would be placed in the camping/staging area. The Camping/staging areas would not be located in wilderness. Camping/staging areas would be raked out by hand, using a garden rake, prior to departing the site.

Funding. The proposed action would be funded predominantly by Luke AFB and implemented principally by the AGFD. Initial funds (\$350,000) were transferred from Luke AFB to the AGFD to prepare the research proposal, the environmental assessment, and begin implementation if the project is approved. The BLM also contributed staff time for preparation of the environmental assessment and \$40,000 for implementation.

The total \$390,000 is sufficient to fund the proposed forage enhancements for approximately two years. These funds are not irreversible; if the project does not proceed the funds can be withdrawn and reprogrammed for other purposes. The Air Force would continue to fund the project in the future. MCAS Yuma has programmed future funds for this project, and BLM may

continue contributing to the effort.

Monitoring of results. The five hypotheses would be tested according to the monitoring plan (see Appendix A-Hypotheses Testing and Monitoring).

Participants. Personnel that participate in the projects would primarily be composed of AGFD, LAFB, MCAS, USFWS, and BLM employees. Additional participants from the public could volunteer and could include members of the Friends of Cabeza Prieta, The Wilderness Society, The International Sonoran Antelope Foundation, Desert Wildlife Unlimited, Arizona Wildlife Federation, Arizona Antelope Foundation and Defenders of Wildlife. There are existing Cooperative Agreements between the AGFD and other involved groups. Members of the Sonoran Pronghorn Recovery Implementation Team could also participate.

Project Success. The project would be determined to be successful if more fawns survive the first summer within the treated areas compared to control areas outside the project area (such as on the Cabeza Prieta NWR).

Project Duration. The overall project duration would be seven years. The project would enhance forage conditions for pronghorn, and is designed to improve fawn survival and increase the population to a point where pronghorn could be translocated into new areas outside of their current range (Recovery Plan Step 2). The precise locations for translocated pronghorn would be determined by the Sonoran Pronghorn Recovery Team and in subsequent environmental documents.

Enhancement of forage resources could be discontinued following successful introduction of pronghorn into historic habitat, or when it is shown that the forage enhancement efforts are not effective. The decision to discontinue forage enhancement efforts would be made by the Sonoran Pronghorn Recovery Team.

At the completion of the project, the three wells would be left in place and capped using conventional well-capping techniques.

B. Alternative B.

In this alternative, 10 forage enhancement plots would be considered in the same locations as described in Alternative A, as well as five additional sites as shown in Table 2 and Figure 3, for a total of 15 plots. Creosote thinning would take place according to the specifications given in Alternative A, and would cover a total of 11.06 km². Instead of drilling irrigation wells, water would be hauled to all the plots using water trucks. Water trucks would be used to fill storage tanks located at each of the enhancement plots.

Water would be pumped from the water storage tanks to a sprinkler system as described in Alternative A to irrigate a portion of each of the 15 plots. The irrigated area would be approximately 1.85 acres per plot, for a total of 27.8 acres covered in the water-sprinkling program in this alternative. Water would be hauled from the nearest large water source (canal or well), and irrigation would generally be accomplished at night when evaporative loss would be minimized and pronghorn are the least likely to be disturbed. Water would not be supplied to storage tanks by truck when pronghorn are present in the area.

Preliminary permission for the acquisition of water has been received from the Wellton-Mohawk Irrigation and Drainage District. Water acquisition would result from a contract or agreement with the irrigation district. Only suitable water sources would be used; water would not be drawn from salt or other agricultural drains.

Four additional freestanding water systems would be installed (Mohawk Drag Road East, South Aguila, Central San Cristobal, and Mohawk Valley) for a total of nine. It is anticipated that two additional camping/staging areas would be used if this alternative is implemented. The additional sites would be in the vicinity of the Central San Cristobal and South Aguila plots. The participants and the monitoring of the hypotheses would be the same as described in Alternative A and in Appendix A.

C. No Action Alternative.

No habitat manipulations for Sonoran pronghorn would occur at this time on the Barry M. Goldwater Range. Sonoran pronghorn in the area would continue to be dependent upon the existing water sources and forage conditions, which in turn, depend on rainfall. Other opportunities to improve habitat and recover the Sonoran pronghorn would remain, but would not be undertaken at this time.

D. Alternatives Considered But Rejected.

1. *Cabeza Prieta National Wildlife Refuge*

An alternative was considered where three of the forage enhancement plots were considered within the non-wilderness portion of Cabeza Prieta NWR. USFWS requested that this alternative not be considered until completion of the Cabeza Prieta Comprehensive Conservation Plan (CCP). Forage enhancement plots may be considered in the future on the refuge.

2. *Tactical Range*

An alternative was considered where forage enhancement plots would be placed on the tactical ranges within BMGR. This alternative was rejected because plots are intended to duplicate features that already exist on the tactical range. Pronghorn use of plots on the tactical range could potentially be incidental, with other features attracting animals to the area. While the forage enhancement plots are intended to supplement forage needs, they would also likely affect distribution during critical seasons. To increase the attraction of pronghorn to the tactical range would present no advantage to the evaluation of the project and would increase the chance that human activity may affect individual pronghorn.

3. *Fewer Plots*

An alternative was considered where only three or four of the forage enhancement plots would be created. This alternative was rejected because reducing the number of plots greatly reduces the likelihood that Sonoran pronghorn would actually discover the plots and incur any corresponding benefits. Fewer plots would also make it more difficult to adequately test the hypotheses.

4. *Free Water Only*

An alternative was considered where free water would be provided at each of 10 plots, but no efforts would be made to provide additional forage for pronghorn. This alternative was rejected since it is most likely the availability of forage that is limiting the survival of pronghorn fawns in the late spring and early summer, rather than water at this time of the year.

5. *Forage Enhancement Only*

An alternative was considered where efforts would be made to provide additional forage for pronghorn at each of the 10 plots. However, no effort would be made to provide free water. This alternative was rejected since free water assists the pronghorn in digesting high-protein forage.

6. *Creosote Burning Only*

An alternative was considered where efforts would be made to burn creosote bushes on 10 forage enhancement plots without implementing any of the other project measures. The same methods to burn creosote would be used as described in the proposed alternative. This alternative was rejected because it would take too long to be effective. Additional forage for the pronghorn would develop based on available rainfall. This alternative fails to immediately address the needs of the pronghorn with regard to forage availability, and also fails to address the benefits of free water on the digestion of forage.

7. *Artificial Feeding Program*

An alternative was considered where the pronghorn would be provided alfalfa hay or hay pellets in several areas. This alternative was considered, but rejected since hay or pellets are generally very dry and would not provide the animals with moist forage. It is also unlikely that alfalfa or pellets would be found easily by pronghorn since they are not a natural food. This alternative also fails to address the benefits of free water to pronghorn.

8. *Cholla Planting Program*

An alternative was considered where chainfruit cholla would be planted in suitable sites on the BMGR in order to increase their availability for pronghorn. This alternative was rejected since chainfruit cholla provides little in the way of nutrition, but does provide needed moisture. This alternative fails to address the need of the pronghorn fawns to have moist, nutritious food during the critical period after weaning.

The distribution of chainfruit cholla on the BMGR suggests that it has had an opportunity to spread over the years, but is restricted to a few areas with appropriate soil and moisture conditions. It is further suspected that efforts to establish new populations of chainfruit cholla would not be successful.

9. *Ak Chin Farming Techniques*

Ak Chin farming techniques were considered in the draft EA as a way of directing some of the rainwater that falls on the desert pavement terraces into areas where increased plant growth could occur. It was determined that Ak Chin farming techniques could only be applied in those areas that are on the outwash plains, or bajadas, of the desert mountain ranges. Because they have such limited applicability within the area that Sonoran pronghorn use on the BMGR, this alternative was rejected.

III. AFFECTED ENVIRONMENT

A. Soils. The proposed project sites are all located in inter-mountain basins, or desert flats. The soils in these areas are highly variable depending on the parent rock, but are primarily unconsolidated alluvium composed of sand, silt, clay and gravel.

B. Vegetation. Vegetation at each of the proposed project sites is typical of the "creosote flats" in this region, and includes creosote (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), big galleta (*Pleuraphis* [*Hilaria*] *rigida*), teddy bear cholla (*Opuntia bigelovii*), buckhorn cholla (*O. acanthocarpa*), brittlebush (*Encelia farinosa*), ironwood (*Olneya tesota*), desert lavender (*Hyptis emoryi*), foothill and blue paloverde (*Cercidium microphyllum* and *C. floridum*, respectively). A few saguaro cactus (*Cereus giganteus*) also may be found in the general area.

C. Wildlife. There is a diverse variety of wildlife species on the Barry M. Goldwater Range. The species that occupy the range are primarily those that are common to the mountains and bajadas of the Sonoran Desert. This includes, but is not limited to, white-winged and mourning doves (*Zenaida asiatica* and *Z. macroura*, respectively), numerous perching birds, red-tailed hawks (*Buteo jamaicensis*), desert bighorn sheep (*Ovis canadensis*), desert mule deer (*Odocoileus hemionus crooki*), desert cottontails (*Sylvilagus auduboni*), coyotes (*Canis latrans*), ringtails (*Bassariscus astutus*), gray foxes (*Urocyon cinereoargenteus*), round-tailed ground squirrels (*Citellus tereticaudus*), western diamondback rattlesnakes (*Crotalus atrox*), kingsnakes (*Lampropeltus getulus*), side-blotched lizards (*Uta stansburiana*), and western whiptail lizards (*Cnemidophorus tigris*).

D. Threatened and Endangered Wildlife and Plants. No federally designated threatened or endangered species, other than Sonoran pronghorn, are known to occur within the proposed project sites. Several proposed plots are within 50 miles of known lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) roost sites (Bluebird Mine, OPCNM). BLM designated the Copper, Gila, and Mohawk Mountains as Category 3 Sonoran desert tortoise (*Gopherus aegises*) habitat. The Sonoran Desert population of the desert tortoise is not listed by the USFWS, but is on the AGFD proposed list of Wildlife of Special Concern.

Rare plant inventories of the BMGR have failed to discover any listed plants within the project areas (Eakle and Smith 1988).

E. Land Use and Ownership. The project sites within the Barry M. Goldwater Range are on lands administered by the Yuma and Phoenix Field Offices, BLM. Four of the project plots lie within the portion primarily used by the MCAS, while the balance lie within the area primarily used by LAFB, Glendale.

Recent legislation, the National Defense Authorization Act of 1999, will transfer the natural resource management responsibility on the BMGR from the BLM to LAFB and MCAS. Land activities on the BMGR include military training and practice, as well as authorized recreation use by the public. Public visitation is provided through a visitor permit system.

The project area receives traffic by people crossing the International Border illegally and driving and walking into the United States. Some of the vehicle routes, which cross the Cabeza Prieta NWR Wilderness and the BMGR, receive traffic by undocumented immigrants.

F. Cultural Resources. An archeological clearance was conducted at all of the project sites proposed under Alternative A. Two archaeological sites found were recommended as eligible for the National Register of Historic Places (NRHP) under Criterion *d*, for their potential to yield information on the topics of chronology, settlement, trade routes and organization of exchange, cultural affiliation and ethnic boundaries. An additional 54 (52 on the Air Force plots, 2 on the Marine plots) isolated occurrences were found. The isolated occurrences have good integrity; however, beyond their locations and nature, they do not appear to contribute additional information (see Appendix C - Cultural Resource Survey Summaries).

G. Climate and Air Quality. The project sites are located where the average annual precipitation is approximately four to five inches. Most of this rainfall occurs in the winter. The annual temperature extremes range from 32° F to 120° F. Air quality is usually excellent except when high winds stir up dust.

H. Topography and Soils. The proposed project sites are on the bajadas (outwash slopes) or within the valleys surrounding the Mohawk, Sierra Pinta, Growler, Aguila, and Crater Mountains. The projects are proposed in soils that are unconsolidated alluvium, composed of sand, silt, clay, and gravel.

I. Visual Resources. All of the project sites located on the Barry M. Goldwater Range are within areas which have received interim designation as Visual Resources Management Class III. Final classes are to be developed in the future. The level of change within a Class III Visual Resources Management area should be moderate. It may attract the attention, but should not dominate the view of the casual observer. Any changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

J. Recreation. Most of the recreational activity on the Goldwater Range occurs in the fall, winter, and spring months. Recreational hiking and hunting occurs in portions of the BMGR. Visitors may access the areas that are open to public entry by obtaining a single permit which covers the easternmost portion of the BMGR (Areas A and B), the western portion of the BMGR (MCAS) and the Cabeza Prieta NWR.

The most popular destinations on the BMGR are the Camino del Diablo, Fortuna Mine and Tinajas Altas. The AGFD usually issues approximately four desert bighorn sheep hunting permits annually for this portion of BMGR (Gila Mountains - 1; Tinajas Altas - 1; Copper/Mohawk - 1 or 2). Approximately seven desert bighorn sheep hunting permits are issued annually for the Cabeza Prieta NWR. There is also some quail hunting on the BMGR and on public and State lands north of the BMGR.

Only two of the proposed forage enhancement sites described in the proposed action are located in areas where there is some recreational use (Point of the Pintas #1 and #2). The remaining eight sites are within the portion of the Barry M. Goldwater Range where public access is not usually authorized. Under Alternative B, five of the proposed forage enhancement plots are located in areas where there is permitted public use (Point of the Pintas #1, Point of the Pintas #2, Mohawk Drag Road West and East, and Mohawk Valley).

K. Water, Surface and Ground. No perennial springs or streams exist in the immediate project area. Ephemeral washes provide the surface drainage system for storm runoff. Groundwater on the BMGR lies within the Lower Gila Hydrologic Basin. Most groundwater development has occurred in the broad alluvial plains that border the Gila River. There are discontinuous lenses of groundwater throughout the sands and gravels in the alluvial plains that border the Gila River Valley. Groundwater levels vary from 19 to 50 feet deep near the Gila River to as deep as 415 feet in the adjacent alluvial plains. In the upgradient, intermountain valleys where the plots are planned, the alluvium contains perched systems at depths less than 100 feet BGS. These systems in loose or 'less cemented' gravels overlying compacted clayey gravels or hardpan, yield water of variable quantities and quality. Deeper wells, with depths of 200 and 300 feet, have supplied ground water in the past in the upgradient valleys, but they are now dry or destroyed and stratigraphic information was never documented.

A total of 3,837,000 acre-feet of ground water was pumped in the eastern part of the Lower Gila Hydrologic Basin from 1940 to 1984. The estimated recoverable predevelopment groundwater in this portion of the basin was 17,000,000 acre-feet. Groundwater in the project area is recharged primarily by the flow of ephemeral washes, infiltration into the alluvium and percolation to the ground water. Low rainfall and high evapotranspiration rates results in direct precipitation providing negligible recharge.

In the State of Arizona, areas not located within the boundaries of an Active Management Area (AMA) or a Non Expansion Area (INA) are governed by the doctrine of reasonable use, in which a landowner may pump as much groundwater from his property as required for the reasonable use of the property. The BMGR is not located within an AMA or INA and the rules for ground water appropriation on the BMGR are therefore governed by the doctrine of reasonable use. New and

existing wells must be registered with the Arizona Department of Water Resources (ADWR) (1980 Groundwater Code) and installed under drilling standards established by the ADWR.

L. Invasive, Non-native Species. Within the project area, several exotic plants have become established in the last 50 years. These plants include Mediterranean grass (*Schismus barbatus*), Sahara mustard (*Brassica tournefortii*), and buffelgrass (*Pennisetum ciliare*). Of these plants, Mediterranean grass has been established the longest. Sahara mustard has only become established in the last 10 years. Sonoran pronghorn are known to eat small amounts of all of these plants, if they are available. Buffelgrass is not known to inhabit the project area, but can be found on Organ Pipe Cactus National Monument and some parts of the BMGR.

M. Areas of Critical Environmental Concern. One of the plots in the proposed action (Mohawk Dune) lies partly within the 113,000-acre Mohawk Mountains and Sand Dunes Area of Critical Environmental Concern (ACEC). In Alternative B, a second plot (Mohawk Drag Road East) lies within this ACEC. The management prescriptions for this area are described in the Lower Gila South Resource Management Plan - Goldwater Amendment. One of the purposes of the ACEC is to maintain habitat for Sonoran pronghorn.

N. Native American Cultural Concerns LAFB contacted each of the Native American tribes during the month of February 2000 in order to determine if any Traditional Cultural Places or other areas or objects of concern are within the project area. A comment letter received from the Tohono O'odham Tribe states that pronghorn are important to the Tohono O'odham. All of the tribes were contacted by telephone during the spring and summer but no others had any comment.

IV. ENVIRONMENTAL CONSEQUENCES

This chapter contains the analysis of probable impacts to the human environment that would result from the proposed alternatives for forage enhancement. It also contains the analysis of probable cumulative impacts; impacts that would result from other ongoing and reasonably foreseeable activities associated with the alternatives.

The following assumptions were made in the impact analysis.

- Direct impacts are those that would occur on or directly adjacent to the proposed plots and related systems/activities.
- Indirect impacts are those that would occur off of the proposed plot systems.
- Qualitative terms are used to describe the probable magnitude of impacts and the anticipated importance of the impact to the human environment. The terms "major," "moderate," "minor," "negligible" and "no impact" describe magnitude. "Significant," "potential to become significant," and "insignificant" describe the importance of impacts. Impacts are assumed to be insignificant unless otherwise identified.

The following critical impact categories/resources have been analyzed and would not be impacted by Alternative A (proposed action), Alternative B, or the No Action Alternative: ~.

- 1) Wilderness
- 2) Wastes, Hazardous and Solid
- 3) Prime and Unique Farmland
- 4) Water Quality (Surface and Ground)
- 5) Wild and Scenic Rivers
- 6) Wetlands/Riparian Zones
- 7) Floodplains
- 8) Environmental Justice

A. Impacts of the Proposed Action. (Alternative A).

1). Soils and Vegetation - Soil and vegetation disturbance would occur in each of the areas outside of the desert washes and desert pavement terraces. The area of disturbance would vary between each of the 10 project sites, but would be less than 247 acres total for each of the 1 km² plots

Burning of creosote would require foot traffic over much of the plot but negligible soil disturbance. Due to lack of adequate fine fuels (grasses and dried herbaceous matter) between shrubs, burning individually selected plants is not likely to result in escape of fire nor negatively impact the integrity of the community (i.e. no negative impacts to soils, vegetation, or water resources).

The arrangement of sprinkler systems and pipes, wells, water tanks, and free-standing water would disturb about 1.8 acres per plot, for a total of 18.5 acres for the 10 plots combined. The temporary disturbance of one to one and one half acres would occur during well drilling and development for each well. Equipment maintenance and the operation of pumping equipment during an irrigation episode would require the use of access roads. The number of trips would vary in accordance with equipment maintenance needs and rainfall, but could be 20 trips per plot during the late spring/early summer season. Vehicle trips on the unimproved access roads result in dusty conditions during the travel and deposition of dust on adjacent vegetation.

The delivery of water to the storage tank for the Aztec Hills #1, #2, and #3 plots using a water truck would require driving down the access roads repetitively. The actual number of trips would vary depending on the current soil conditions and rainfall, but could be expected to be at least 10 trips per plot per late spring/early summer season. It is expected that the water trucks would raise dust on the existing roads so that adjacent bushes along the road become dusty.

The burial of the temporary free-water systems can be expected to disturb an area of approximately 35 feet by 10 feet to a depth of 30 inches (for each system). The installation of these systems would be accomplished by hand or with a small backhoe. The soil surface would be returned to original contour after installation of the system and vegetation would be allowed to re-establish over the water system. Native perennial plants may be re-seeded in the area to speed restoration. It usually takes several years for desert vegetation to become re-established.

If the project is not found to be successful or is no longer needed, the underground water systems would be removed and native perennial plants would be allowed to re-establish. The re-establishment of perennial plants would be facilitated by the uneven boundary of the project sites and their proximity to undisturbed areas, which would act as a seed source.

There would be an additional disturbance to an area of about two acres total for the entire project for camping/staging areas. These would lie along the existing roads leading to or within each of the project sites where the camping and equipment staging area would be located. This impact is expected to be slight, contained within the area established for this project, and in previously established camping areas.

The Agencies conclude that impacts to soils and vegetation associated with Alternative A would be minor in the short and long terms.

2). Wildlife - The establishment of disturbed areas with increased forage production and water for Sonoran pronghorn could attract other species of wildlife as well, including rabbits, rodents, coyotes, painted lady butterfly caterpillars, and seed-eating birds.

A temporary displacement of wildlife at each of the sites during construction as a result of human activity is expected.

European honeybees would likely make use of the new water, just as they do with any water (including small rainwater puddles) in the area. Feral European honeybees are already well established in southwestern Arizona.

Predators There has been concern expressed in the past about attracting small predators to either the artificial water sources or to increased prey densities from the rodents and rabbits likely to be on or near the forage plots. Predators (foxes, coyotes, and bobcats) are not uncommon throughout the BMGR, Cabeza Prieta NWR and surrounding areas, including areas without free water.

Kit foxes (*Vulpes macrotis*) and less commonly gray foxes (*Urocyon cinereoargenteus*) inhabit the project area. Foxes are independent of freestanding water (Golightly 1984); therefore, their distribution and abundance may be influenced by, but not dependent on, water. Foxes could become more common in the project areas due to increased small mammal prey species on the forage plots. However, foxes, due to their small size and preference for alternative smaller prey, are not considered predators of either adult or fawn pronghorn.

Shaw noted the abundance and wide distribution of bobcats on the BMGR (Shaw et al. 1988). Bobcats generally prefer washes and rougher terrain than the proposed forage plots. In addition, bobcats are territorial and are not expected to increase or alter their distribution in response to increased small mammals at the plots. Resident bobcats could ambush and kill fawns or adults, but this threat is no more likely with or without forage enhancements, and the openness created by thinning the creosote should reduce this risk.

Coyotes also inhabit the project area. Little physiological work exists for coyotes, although they are frequently observed great distances from available water. In general, it appears that these predator populations are independent of water. Densities of coyotes could increase in response to increase small mammal prey at the forage plots. Because of the abundance of small prey, coyotes would not likely form packs at this time of the year; single coyotes generally cannot kill adult pronghorn. AGFD personnel have observed Sonoran pronghorn and coyotes together at a water source on the tactical range. In these instances, pronghorn dominated the coyotes and caused them to leave the area. Coyotes are effective predators of young fawns to about 3 weeks of age. If coyote predation on fawns or adults at the plots becomes substantial, alternatives such as lethal removal, non-lethal removal or discontinuing the plots would be evaluated at that time.

Mountain lions exist in very low densities on the BMGR. Their preferred habitat is rough terrain and thick cover and their main prey is deer. It is unlikely that mountain lions would encounter the plots, because the plots are in flat terrain with fairly open vegetation.

AGFD inspects over 250 wildlife water catchments in southwestern Arizona on a frequent basis during the summer. Each year, an average of seven predator kills are recorded at the catchments. Most of these are noted at water catchments that have been placed in or near areas of thick vegetation. Predator kills have not been documented in the vicinity of any of the water sources used by wildlife in the western portion of the Goldwater Range. The proposed free-standing water and forage enhancements would be located in open habitat not conducive to ambush, which would minimize a predator's advantage at the catchment.

The availability of free-standing water and increased forage in new locations during the late spring/early summer would likely have little to no long-term effect on the population levels or distribution of coyotes, fox, nongame mammals, or nongame birds based on the investigations conducted by Smith and Henry (1985) and Burkett and Thompson (1994).

Recognizing that there are gaps in the information available and some contradiction in the literature, there still is convincing evidence that the availability of free water benefits wildlife populations.

Traditionally, freestanding water has been considered the primary limiting factor for desert game species in Arizona. This continues to be the consensus among many wildlife specialists.

Competitors. Desert bighorn sheep are not expected to make use of the free-standing water or forage proposed in this project since they would not be located in areas or habitats traditionally used by desert bighorn sheep. Potential competition from desert mule deer was considered but determined to be unlikely. Mule deer typically inhabit washes and bajada habitats, and are less likely to be in open creosote flats, especially in dry seasons/years. Mule deer may be in the areas of the plots in winter, but due to their greater demand for water (than pronghorn), they will have moved to other locations with permanent water prior to the pronghorn waters being activated in mid-late summer.

Disease. According to blood tests from Sonoran pronghorn captured during radio-collaring efforts, they have been exposed to bluetongue virus, epizootic hemorrhagic disease, and to a lesser extent, leptospirosis. The blood tests suggest that the pronghorn were exposed and either never developed clinical disease or they were clinical and recovered.

Leptospirosis is a water-borne disease; the organisms survive in surface waters for extended periods. Infection is acquired from skin or mucous membrane contact with urine, and to a lesser extent, by intake of urine-contaminated feed or water.

Bluetongue and epizootic hemorrhagic disease are closely related, non-contagious, insect-transmitted, viral diseases of cattle, sheep, goats, and wild ruminants. All evidence of trans-species spread of these diseases has been from domestic livestock to wildlife. Occasional mortality has been reported in mule deer and pronghorn from epizootic hemorrhagic disease, and high antibody prevalence indicates that most infected animals survive the infection. There have been no reports of epizootic hemorrhagic disease outbreaks in the southwestern United States (Hoff and Trainer 1981).

Bluetongue and epizootic hemorrhagic disease are both spread by the biting midge, *Culicoides* spp. Epizootics of bluetongue and epizootic hemorrhagic disease have generally occurred in the late summer and early fall. Both diseases are associated with wet weather and most epizootics have been in moist, low-lying areas. The fact that many Sonoran pronghorn have been exposed to bluetongue and epizootic hemorrhagic disease shows that *Culicoides* exists within pronghorn range and the required living conditions for *Culicoides* occurs naturally. These areas are most likely low-lying clay-bottom playas, which hold water for extended periods after summer rains.

By having water in concrete-lined water troughs and only having water available during the hot summer, the risk of pronghorn contracting any of these diseases should not greatly increase since free-standing waters and the forage plots would not be created in moist, low-lying areas. Pronghorn very likely would not be using these areas in the late summer and fall when the diseases generally occur.

Blood samples from Sonoran pronghorn show low vitamin levels, which suggest poor nutrition prior to the time the samples were collected. Providing increased nutritional forage should outweigh potential risks of disease. In addition, well-fed, hydrated animals are better-equipped to fight infection from disease.

3). Threatened and Endangered Species - The proposed project is expected to increase forage quantity and quality for Sonoran pronghorn during the late spring and early summer months. Fawn survival is expected to increase resulting in recruitment of more fawns each year into the population. The addition of free water during these critical periods is expected to allow the lactating does to continue to produce milk for their young, thereby increasing their survival. Healthy, well-fed and hydrated pronghorn are more resistant to disease, are more alert to and able to outrun predators, and are better able to withstand disturbances.

Burning of creosote, well drilling, sprinkler set-up, and the installation of free-standing water would be done during the times of the year (fall, early winter) when Sonoran pronghorn are not likely to be using the plot areas. The project areas would be visually scanned prior to any work to avoid pronghorn disturbance. The use of a sprinkler system and wells would reduce the amount of noise from vehicles. Appendix B contains an anticipated work schedule.

Every effort would be made to minimize disturbance to pronghorn, however we believe that any accidental disturbance to individual pronghorn would be temporary and would be offset by the beneficial effects of the project.

Lesser long nosed bats are known to roost 50 miles away, near Organ Pipe Cactus National Monument. Since we would not be disturbing foraging habitat (saguaro and/or agave stands), there would be no foreseeable effect on this species.

The Agencies conclude that the adverse impacts to wildlife associated with Alternative A would be negligible in the short and long terms.

4). Land Use and Ownership - No changes to land use or ownership would result from the proposed action.

The Agencies conclude that there would be no impacts to land use and ownership associated with Alternative A.

5). Cultural Resources - A survey of cultural resources has been completed on the proposed plots. All cultural resources, including affiliated buffer zones, would be completely avoided by the project. The size and shape of the buffer areas would be determined by the archeologists. Avoidance areas would be marked in a way that allows those participating in the project to easily avoid the areas while not attracting too much attention to the cultural resource sites

Since all cultural resources would be avoided, the Agencies conclude that the impacts to cultural resources associated with Alternative A would be negligible in the short and long terms.

6). Air Quality - The use of gas-powered tools and vehicles used to reach and implement the proposed projects would produce small amounts of carbon monoxide emissions and dust. Airborne dust in the immediate area of creosote removal and the installation of the temporary free-water systems would increase immediately after project construction, especially during periods of wind. Burning of individual creosote shrubs can be expected to produce temporary smoke. This impact is expected to be negligible. The movement of water trucks, maintenance vehicles and irrigation crew vehicles on the existing dirt roads would produce dust, which would remain in the air temporarily.

The Agencies conclude that the impacts to air quality associated with Alternative A would be minor in the short term and negligible in the long term.

7). Visual Resources - The design of the proposed project follows the guidelines for a Class III visual resources management area. Each forage enhancement area would have irregular boundaries and would be covered with annual forage. Later, when the annual forage plants have dried up, their appearance would be a natural component of the landscape. Efforts would be made to avoid creating any straight lines during creosote removal and to leave creosotes along the roads used by the public.

The Agencies conclude that the impacts to visual resources associated with Alternative A would be negligible in the short and long terms.

8). **Recreation** - Providing water and forage for Sonoran pronghorn during the late spring/early summer is designed to increase the number of pronghorn. This may not affect or may very slightly increase recreational use through additional wildlife viewing opportunities. Only two of the proposed forage enhancement plots under Alternative A are in areas currently accessible to the public (Point of the Pintas #1 and #2).

The Agencies conclude that the impacts to recreation associated with Alternative A would be negligible in the short and long terms.

9). **Water (Surface and Ground)** - No effect to local surface water drainages or related water sources is expected to result from the proposed action. The wells used to irrigate the plots would use approximately 10-15 acre-feet of ground water each year, depending on rainfall. According to the Arizona Department of Water Resources, the estimated available groundwater in the San Cristobal Valley portion of the Lower Gila Hydrologic Basin far exceeds the demands that would be placed on it from the three proposed wells. The amount of water required to be hauled to the three Aztec Hills plots is estimated at 2-3 acre-feet per year. This water would be available from the Wellton-Mohawk Irrigation and Drainage District and other sources, and is not expected to adversely impact other users or uses.

The Agencies conclude that the impacts to surface and ground water associated with Alternative A would be minor in the short term and none in the long term.

10). **Invasive, Non-native Species** - Numbers of Sahara mustard or buffelgrass plants may increase in the areas where creosote removal is proposed to take place. Sonoran pronghorn are known to eat small amounts of both plants. Sahara mustard may be removed by hand within the watered areas. It would be clear that Sahara mustard or buffelgrass is competing with the native forbs if the density of native forbs is less within the plots than outside of the plots. Buffelgrass would be aggressively removed if found on the forage plots.

The Agencies conclude that the impacts from invasive, non-native species associated with Alternative A would be negligible in the short and long terms.

11). **Areas of Critical Environmental Concern** - One plot proposed in Alternative A (Mohawk Dune) is partially within the Mohawk Mountain and Sand Dune ACEC. Establishment of this plot would follow the guidelines for the management of this ACEC. Care would be taken to soften the outline of the plots by avoiding straight lines. Existing roads would be used to access the Point of the Pintas plots and the Mohawk Pass and Mohawk Dune plots, which follow the boundary of the Mohawk Mountains and Sand Dunes ACEC.

The Agencies conclude that the impacts on ACECs associated with Alternative A would be negligible in the short and long terms.

B. Impacts of Alternative B

1). **Soils and Vegetation** - Soil and vegetation disturbance within each of the 15 proposed plots would be of the same type as in Alternative A, although the overall project area would increase (from 8.03 km² to 11.06 km²).

There would be dust associated with water hauling, and although the dust can be expected to dissipate between trips, it would likely coat the shrubs near the roads. The actual number of trips would vary depending on the current soil conditions and rainfall, but could be expected to be at about 10 trips per plot per year.

The burial of the temporary free-water systems would disturb four more areas than in Alternative A (from 1400 ft² to 3150 ft²). The free-water system areas would lie within the overall project area of 11.06 km². Two additional camping/staging areas would disturb approximately two acres total in the vicinity of the more remote Central San Cristobal and South Aguila plots.

The Agencies conclude that the impacts to soils and vegetation associated with Alternative B would be minor in the short term and negligible in the long term.

2). Wildlife - The establishment of additional forage for Sonoran pronghorn under Alternative B could be expected to have similar effects to other species of wildlife, including predators, as in Alternative A.

3). Threatened and Endangered Species - The proposed project is expected to increase forage quantity and quality for Sonoran pronghorn as in Alternative A, and improve fawn survival. The establishment of 15 plots would increase the likelihood that Sonoran pronghorn would discover the forage enhancement plots.

Without the establishment of wells, the forage enhancement would tend to be more flexible in its locations, allowing land and wildlife managers to easily evaluate alternative locations in the future.

The effects of Alternative B on pronghorn use of the impact areas are expected to be the same as Alternative A.

The Agencies conclude that the overall impacts of Alternative B are the same as those for Alternative A.

4). Land Use and Ownership - No changes to land use or ownership would result from Alternative B.

The Agencies conclude that there are no impacts on land use and ownership associated with Alternative B.

5). Cultural Resources - Surveys for cultural resources would be expanded to cover the larger area considered under Alternative B. Any cultural resources found would be avoided as well, therefore, the kinds of effects on cultural resources from Alternative B are the same as Alternative A.

The Agencies conclude that the overall impacts of Alternative B are the same as those for Alternative A.

6). Air Quality - The increased use of water trucks proposed in Alternative B would increase the amount of dust produced by the proposed project. The dust produced by the project is expected to be temporary and local. Other impacts to air quality would be the same as in Alternative A.

The Agencies conclude that the impacts to air quality associated with Alternative B would be minor in the short term and negligible in the long term.

7). Visual Resources - The design of the proposed project in Alternative B would follow the same visual resource management guidelines as in Alternative A.

The Agencies conclude that Alternative B would have the same overall impacts on visual resources as Alternative A.

8). **Recreation** – The Agencies conclude that the kinds of effects to recreation resources of Alternative B are expected to be the same as Alternative A. A total of five of the plots would lie in the portion of the BMGR that is open to the public potentially making the project more obvious to the visiting public.

9). **Water (Surface and Ground)** – Alternative B would not be expected to have impacts to surface water drainage systems or related water sources in the project area. The amount of water required for the plots in Alternative B is estimated to be 25-30 acre-feet per year, and would be available from the Wellton-Mohawk Irrigation and Drainage District and other sources. No adverse effect to local water sources or users would be expected to result from the proposed project

The Agencies conclude that the impacts on surface and ground water associated with Alternative B would be minor in the short term and none in the long term.

10). **Invasive, Non-native Species** - The Agencies conclude that the effects on invasive, non-native species would be expected to be the same in Alternative B as in Alternative A.

11). **Areas of Critical Environmental Concern** - The establishment of one forage enhancement plot (Mohawk Drag Road East) within the Mohawk Mountain and Sand Dune ACEC, and a second forage enhancement plot partly within the ACEC (Mohawk Dune), would follow the guidelines established for the management of this ACEC. Burning would be used to thin creosotes. The temporary free-water systems would be established. Only existing routes would be used when watering the plot with the water truck. Care would be taken to soften the outline of the plots by avoiding straight lines.

The Agencies conclude that the impacts on ACECs associated with Alternative B would be negligible in the short and long terms.

C. Impacts of the No Action Alternative.

1). **Soils and Vegetation** - No soil or vegetation would be disturbed as a result of this alternative.

2). **Wildlife and Threatened and Endangered Species** - Wildlife would continue to use the existing water sources and available forage.

Some of the objectives in the *Lechuguilla-Mohawk Habitat Management Plan* (1997), the *Barry M. Goldwater East Habitat Management Plan*, and the *Final Revised Sonoran Pronghorn Recovery Plan* (1998) would not be met. The wildlife objectives in the *Yuma District Resource Management Plan* and *Lower Gila South Resource Management Plan-Goldwater Amendment* would not be met. There would be a delay in meeting the objectives in the AGFD's *Wildlife 2000 Strategic Plan* (1996-2000).

3). **Land Use and Ownership** - None

4). **Cultural Resources** – No impacts on cultural resources would occur.

5). **Climate and Air Quality** – The impacts on air quality described under the proposed action would not occur.

6). **Topography and Soils** – The impacts on topography and soils described under the proposed action would not occur.

7). **Visual Resources** – There would be no impacts to visual resources.

8). **Recreation** – The impacts to recreation described under the proposed action would not occur. There would, however, be no increase in the number of pronghorn that might otherwise be seen by the public.

9). **Water (Surface and Ground)** – There would be no impacts to water resources under the no action alternative.

10). **Invasive, Non-native Species** – There would be no impact to exotic plants and animals under the no action alternative.

11). **Areas of Critical Environmental Concern** – There would be no impact to the Mohawk Mountains and Sand Dunes ACEC, or any other ACEC, under the no action alternative.

D. Cumulative Impacts.

Cumulative effects are those additive or interactive effects that would result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Interactive effects may be either countervailing—where the net adverse cumulative effect is less than the sum of the individual effects—or synergistic—where the net adverse cumulative effect is greater than the sum of the individual effects. In the subsections that follow, actions that may have cumulative effects are described in general terms, followed by an assessment of the environmental resources likely to be affected.

The areas within the BMGR (excluding the portion west of the Gila Mountains) and the Cabeza Prieta NWR were considered in the analysis of cumulative impacts for a 10-year period.

The Barry M. Goldwater Range is used by MCAS, Navy, Army, and the USAF throughout the year. The eastern portion of the Barry M. Goldwater Range is used for air- to-surface weapons testing and training, including the HE Hill and STAC areas. The U.S. Air and Army National Guards and Reserves also use the BMGR for training. The Cabeza Prieta National Wildlife Refuge airspace is also used by the military for training throughout the year. The entire project area underlies restricted airspace, a Military Operations Area (MOA), where military aircraft have a priority of use from ground level to 80,000 feet above ground level. Legislation, which renewed the military withdrawal on the BMGR for 25 years, was recently signed. Funding for the Department of Defense appears to continue to be stable, and held to about 80% of the Cold War funding.

1). Potential Cumulative Effect Issues

EA for Flash Burning of Military Munitions Residue on the BMGR

The Air Force proposes to introduce flash burning as a new final processing step to ensure that military munitions scrap cleared from the BMGR is free of potentially ignitable explosive, pyrotechnic, or propellant residues before it is released for recycling. EOD personnel clear practice bombs, rockets, and other types of inert military ordnance from approved Air Force weapons targets on the BMGR as part of an ongoing range safety and cleanup program. The munitions scrap is transported to four consolidation points located on the BMGR for temporary storage and final processing. The proposed action to flash burn munitions residue ensures safety within the recycling chain by burning off all ignitable energetic materials before the metals are released to the public.

An environmental assessment is being prepared that analyzes the proposed action (to use on-site flash burning so that demilitarized and decontaminated munitions scrap may be transported off

range for recycling) and the no-action alternative (to continue to store munitions scrap on the BMGR for an indeterminate time).

EA for Cleanup of Inactive Target Areas on the BMGR.

The Air Force is preparing an EA to address Luke AFB's proposal to cleanup munitions and target debris from the surface of several formerly used target areas for both safety and environmental management purposes, while minimizing the environmental impacts associated with the cleanup process. A three-step approach is proposed to evaluate the formerly used target areas. First, the sites will be investigated to determine the type and distribution of munitions and target scrap. Second, a plan of action will be developed for each former target site to determine the most appropriate means for removing munitions and target scrap. It may or may not be appropriate to use the same cleanup process used on active manned and tactical ranges where heavy trucks spaced at about 100-foot intervals are driven in a line-abreast formation along parallel transects across the sweep areas as the primary means to locate ordnance. The third step and major focus of the EA will be to assess the environmental effects of the proposed plans of action for cleaning up formerly used target areas. Different approaches may be used at the various target areas.

EA for the Excavation of Sand and Gravel from Dry BMGR Washes.

The Air Force is preparing an EA for the proposed excavation of sand and gravel from dry washes in the vicinity of the BMGR tactical ranges for use in road repairs and the reconditioning of the manned range strafe pits. A total of seven sites are proposed for excavation as follows:

- one site in North TAC
- one site in South TAC
- one site on the periphery of Manned Range 1
- four sites in East TAC

Additionally, the EA will evaluate the use of North TAC and East TAC excavation sites and the RMCP 1 vicinity for material storage. In accordance with Section 404 of the Clean Water Act, the Air Force will be required to obtain a permit from the Army Corps of Engineers in order to implement the proposed action. The permit application process is being conducted in accordance with the EA process.

Integrated Natural Resource Management Plan for the BMGR.

Public Law 106-65 mandates that the Air Force, Navy, and Department of the Interior shall jointly prepare an Integrated Natural Resources Management Plan (INRMP) for management of the BMGR by 5 October 2001. The plan will be prepared under the Sikes Act and Sikes Act Improvement Act and address the following issues specifically identified in Public Law 106-65:

- proper management and protection of the natural and cultural resources of the range and sustainable use of such resources by the public
- timely consultation with affected Indian tribes, including provisions for meeting federal trust responsibilities, allowing access to and ceremonial use of sacred sites
- use of the BMGR for hunting and trapping
- current test and target impact areas on the range and related buffer or safety zones
- prevention, suppression, and management of brush fires
- design of future range gates, fences, and barriers to allow for wildlife access
- other existing management plans to be incorporated
- periodic review and opportunity for public comment on the plan and any substantial revisions to the plan
- amending the plan as necessary

Integrated Cultural Resource Management Plan for the BMGR.

Luke AFB is developing an ICRMP and implementing programmatic agreement for the entire BMGR. The ICRMP and executed programmatic agreement is expected to be completed by 31 December 2000. The ICRMP considers NHPA requirements as well as those of other heritage preservation legislation, with related documents that address treatment of human burials and repository requirements. Additionally, an inventory was conducted to identify traditional cultural places (and sacred sites) of importance to Native American (or other traditional communities) with ties to the BMGR. This was a major ethnographic study involving contacts and consultation with more than 20 individual Native American communities.

The ICRMP serves all agencies that have current management responsibilities on the BMGR. It is anticipated that the ICRMP and its implementing programmatic agreement will continue to provide the basis for the management of cultural resources and will be incorporated with the INRMP for the BMGR.

Ongoing Operations on the BMGR.

Air and ground operations associated with military training within the area of the proposed action will continue. Environmental impacts resulting from this training are documented in the Final Legislative Environmental Impact Statement for the renewal of the Barry M. Goldwater Range land withdrawal, which provided documentation used to draft P.L. 106-65.

2). Cumulative Effects Associated with the Proposed Action

Cumulative impacts that could result with the action proposed in this EA and the other projects outlined in Section D include the following:

1). **Soils and Vegetation** - No cumulative impacts are predicted.

2). **Wildlife** - Noise associated with well development and other military operations (especially explosive ordnance operations), could have some cumulative noise effects. Human activities associated with the proposed project, proposed paving, ongoing military operations, proposed sand and gravel excavation, and proposed flash burning operations could result in a greater short term disruption to wildlife; however, INRMP efforts could offset such impacts.

3). **Land Use and Ownership** - The area proposed is outside of commonly used areas and other proposed projects. No cumulative impacts are predicted.

4). **Cultural Resources** - If archeological sites or other cultural resources were affected with the proposed action, there could be additive impacts to cultural resources in association with ongoing BMGR operations. However, avoidance of site and resources within the proposed project result in no cumulative impacts being predicted. It is estimated that 600 sites on the BMGR are potentially at risk from military activities with an undetermined additional number of cultural resources subject to effect from other range uses, such as the proposed sand and gravel excavation activities. Impacts of continuing use of the range will be considered and addressed in the ICRMP.

5). **Air Quality** - Cumulative impacts to air quality associated with the proposed project, proposed paving, ongoing military operations, proposed sand and gravel excavation, and proposed flash burning operations would be minor in the short term and negligible in the long term.

6). **Visual Resources** - No cumulative impacts are predicted.

7). **Recreation** - Public access is prohibited without special permission. No cumulative impacts are predicted.

8). **Water Resources (Surface and Ground)** - No cumulative impacts are predicted to local surface water drainages or related water sources.

9). **Invasive, Non-native Species** - No cumulative impacts are predicted

10). **Areas of Critical Environmental Concern** - No cumulative impacts are predicted

The U.S. Border Patrol patrols the BMGR, Cabeza Prieta NWR, Organ Pipe Cactus National Monument, and other lands along the U.S/Mexico border by foot, horseback, 4-wheel drive vehicle, helicopter, and fixed-wing aircraft. The Border Patrol has established roads, generally running parallel to the border which they use as “drag roads” to check for vehicle tracks and footprints. The intensity of their patrols depends upon the number of persons attempting to enter the United States and the intensity of their patrols in other areas.

Undocumented immigrants occasionally drink water from water sources within the BMGR and the Cabeza Prieta NWR. The Border Patrol would be advised of the locations of the free-water sources; they are already aware of existing water source locations.

Smugglers of narcotics and other restricted substances and undocumented immigrants have created unauthorized vehicle routes across the Cabeza Prieta NWR and BMGR, occasionally abandoning vehicles and other supplies.

The public uses the area for recreation and wildlife viewing. This use of the area is expected to continue in the same areas at current levels, although the numbers of recreational users are expected to gradually increase. The military facility on Childs Mountain within the Cabeza Prieta NWR is expected to be established as a Watchable Wildlife Area while unneeded military structures are gradually removed. The USFWS is currently in the process of completing a Comprehensive Conservation Plan for the Cabeza Prieta NWR, which may propose additional uses for the area.

The USFWS and AGFD have a goal of maintaining working radio-collars on 10 percent of the estimated population of Sonoran pronghorn. Future radio-collaring efforts can be anticipated as the batteries in the current collars fail and as collared pronghorn die. Weekly fixed-wing aircraft flights to locate the collared pronghorn are expected to continue.

If the proposed action is implemented and the project is found to be successful, but require long-term work, the project may provide work for contractors and contribute to the local economy. If the project is successful and a transplant of Sonoran pronghorn is completed, it may be found that continuing the project is still beneficial to this original population of pronghorn. Additional forage enhancement plots may be proposed and the environmental impact described in future documents

In conclusion, the proposed project is expected to have a beneficial impact on forage availability and the pronghorn, counteracting, in part, any current cumulative adverse impacts placed on pronghorn habitat by the U.S. Border Patrol, smugglers, undocumented persons, MCAS, LAFB, and the visiting public.

E). Irreversible and Irretrievable Commitments of Resources.

The commitment of resources would be irreversible if the proposed action resulted in a process that could not be stopped and where a resource, its use or productivity is consumed or lost forever. The commitment of resources would be irretrievable if the proposed action eliminated or changed a resource's utility or productivity for the life of the project or over a recovery period.

Irreversible effects associated with Alternative A include the water wells installed for irrigation, and the permanent structures associated with the water wells. Irretrievable effects for both Alternative A and B include the reduced availability of the access roads to wildlife and other uses due to the increased traffic associated with the project, and the potential increase in wildlife densities associated with the increased forage and water. Other irretrievable effects include the loss of the creosote plants, the general restructuring of the vegetative communities and the potential change in soil microorganisms associated with the irrigation

V. CONSULTATION AND COORDINATION

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People and Agencies Consulted

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Public Scoping

A draft Environmental Assessment was available for public review and comment for a 52-day period from February 2 to March 24, 2000. Public notices were published in the *Yuma Daily Sun*, the *Tucson Citizen*, the *Arizona Daily Star* (Tucson), and the Federal Register. Two public meetings were held to discuss and distribute the draft EA. The February 2 meeting held in Tucson was attended by 13 people and the February 9 meeting in Yuma was attended by 33 people.

Fifteen comment letters were received. The writers of seven of these letters were in favor of proceeding with the proposal, six were against the proposal, and two expressed a mixed viewpoint. Most of the comment letters offered excellent constructive comments. A letter to the editor of the *Yuma Daily Sun* printed on April 22 supported the project.

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Table 1. Forage enhancement sites, potential treatments and methods of water application under Alternative A

Site name	Potential Treatment ¹	Size (km ²)	Method of water application	UTM coordinate (Northwest corner)
1. Mohawk Pass	C-I-W	1.0	} well	3611000 N 262000 E
2. Mohawk Dune	C-I-W	1.0		3609000 N 264000 E
3. Granite Mnts. #1	C-I-W	1.0	} well	3592500 N 277000 E
4. Granite Mnts. #2 (NW)	C-I	1.0		3593000 N 276000 E
5. Granite Mnts. #3 (SE)	C-I	1.0		3592000 N 278000 E
6. Aztec Hills #1	C-I-W	1.0	truck	3624700 N 277900 E (north end; 1.7km long X 580 m wide along road)
7. Aztec Hills #2	C-I	0.015	truck	3622784 N 281073 E (south end, 500 meter NE along road, 30 m wide)
8. Aztec Hills #3	C-I	0.015	truck	3622000 N 282200 E (north end, 500 meters south along road, 30 m wide)
9. Point of the Pintas	C-I-W	1.0	} well	3592000 N 250000 E
10. Point of the Pintas #2	C-I	1.0		3591500 N 251000 E

¹ Treatments: C = creosote removal; I = annual and perennial forage irrigation; W = free standing water.

Table 2. Forage enhancement sites, potential treatments and methods of water application under Alternative B.

Site name	Potential Treatment ¹	Size (km ²)	Method of water application	UTM coordinate (Northwest corner)
1. Mohawk Pass	C-I-W	1.0	truck	3611000 N 262000 E
2. Mohawk Dune	C-I-W	1.0	truck	3609000 N 264000 E
3. Granite Mnts. #1	C-I-W	1.0	truck	3592500 N 277000 E
4. Granite Mnts. #2 (NW)	C-I	1.0	truck	3593000 N 276000 E
5. Granite Mnts. #3 (SE)	C-I	1.0	truck	3592000 N 278000 E
6. Aztec Hills #1	C-I-W	1.0	truck	3624700 N 277900 E (north end; 1.7km long X 580 m wide along road)
7. Aztec Hills #2	C-I	0.015	truck	3622784 N 281073 E (south end; 500 meter NE along road, 30 m wide)
8. Aztec Hills #3	C-I	0.015	truck	3622000N 282200 E (north end, 500 meters south along road, 30 m wide)
9. Point of the Pintas	C-I-W	1.0	truck	3592000 N 250000 E
10. Point of the Pintas #2	C-I	1.0	truck	3591500 N 251000 E
11. Mohawk Drag Rd. West	C-I-W	0.015	truck	3598500 N 241500 E
12. Mohawk Drag Rd. East	C-I-W	0.015	truck	3597977 N 252457 E
13. South Aguila	C-I-W	1.0	truck	3602700 N 279600 E
14. Central San Cristobal	C-I-W	1.0	truck	3616500 N 267500 E
15. Mohawk Valley	C-I-W	1.0	truck	3602400 N 236000 E

¹ Treatments: C = creosote removal; I = annual and perennial forage irrigation; W = free standing water.

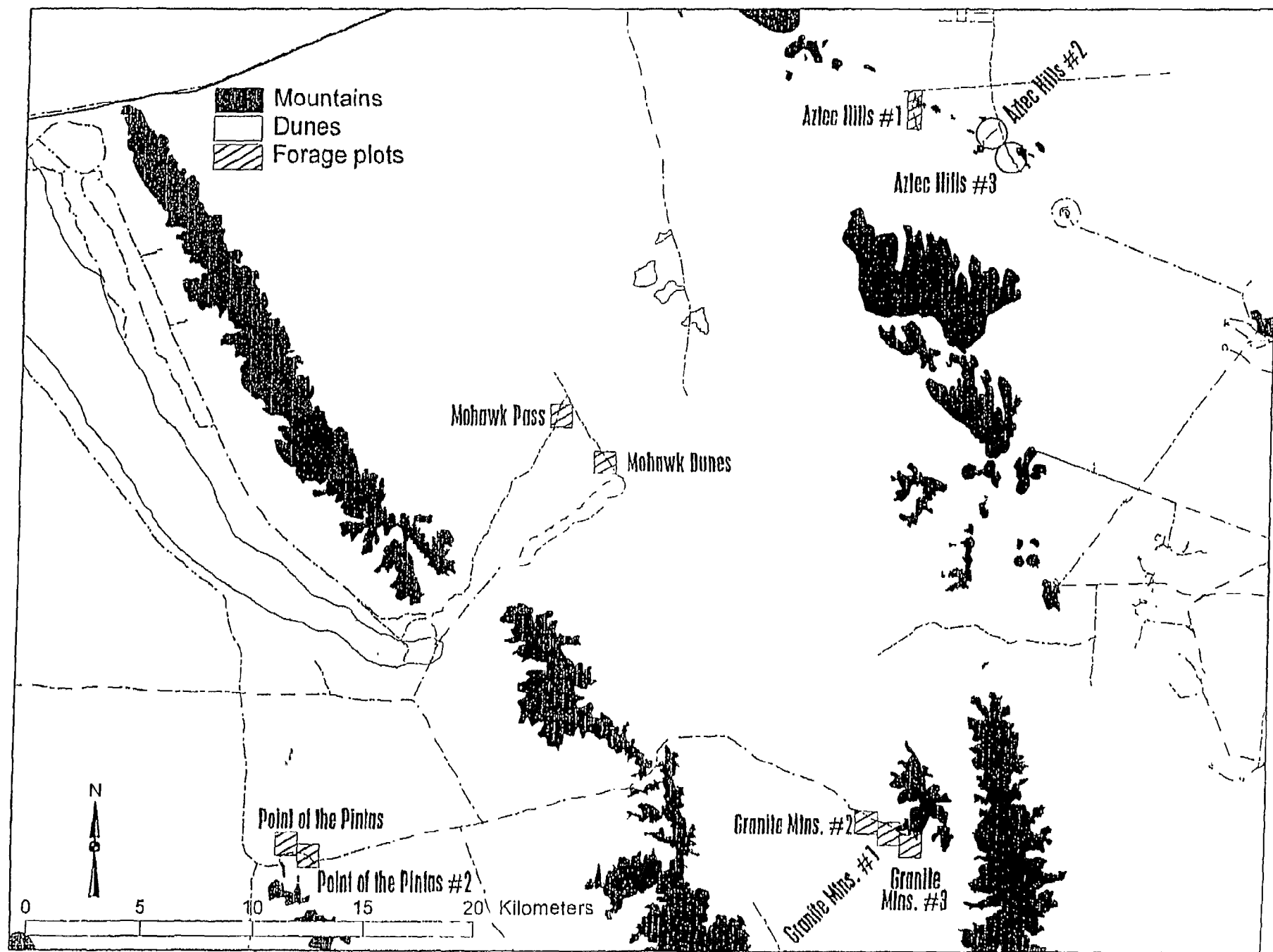


Figure 1. Map of proposed forage enhancement sites under Alternative A

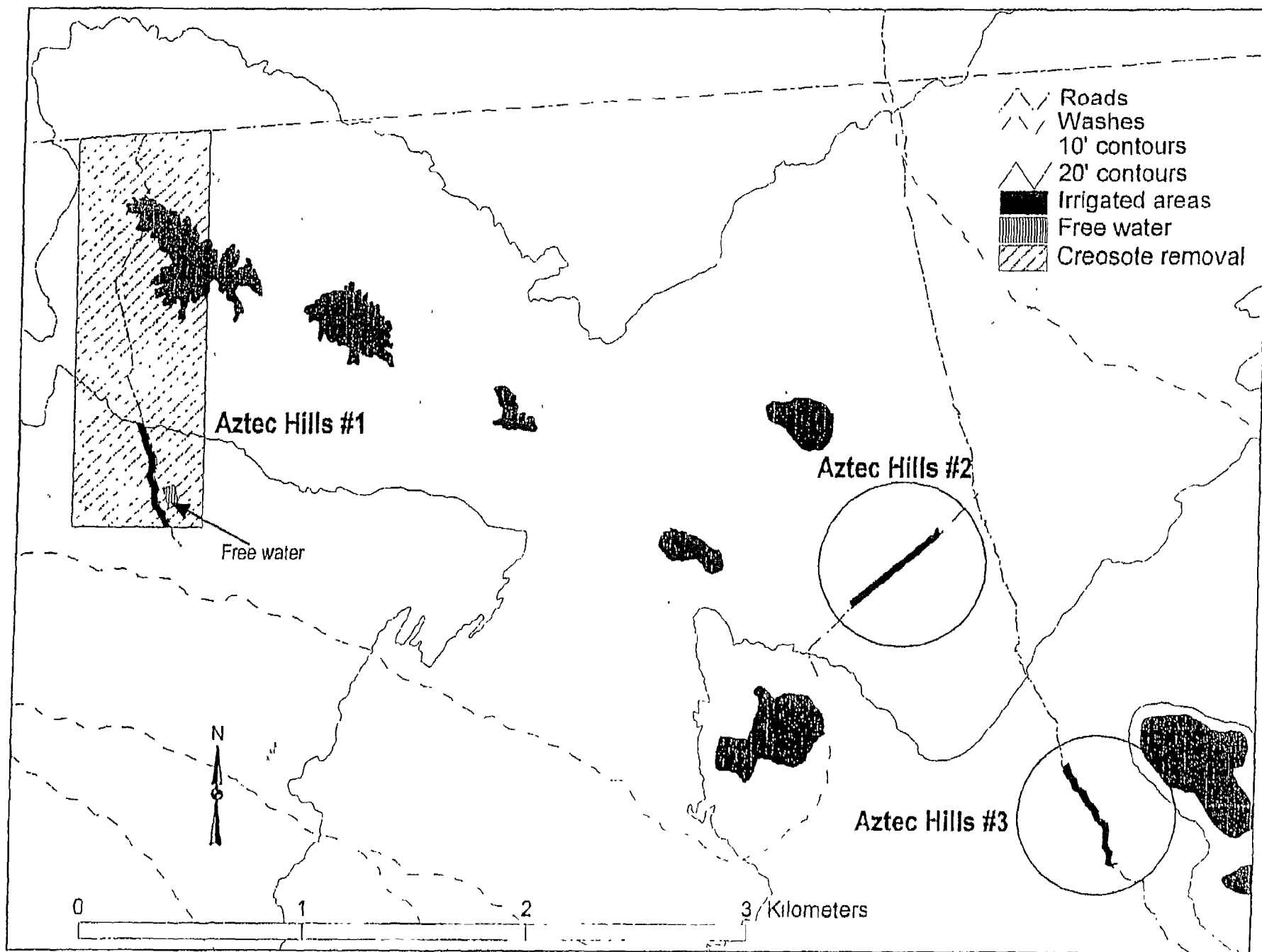


Figure 2. Detail of Aztec Hills forage enhancement sites

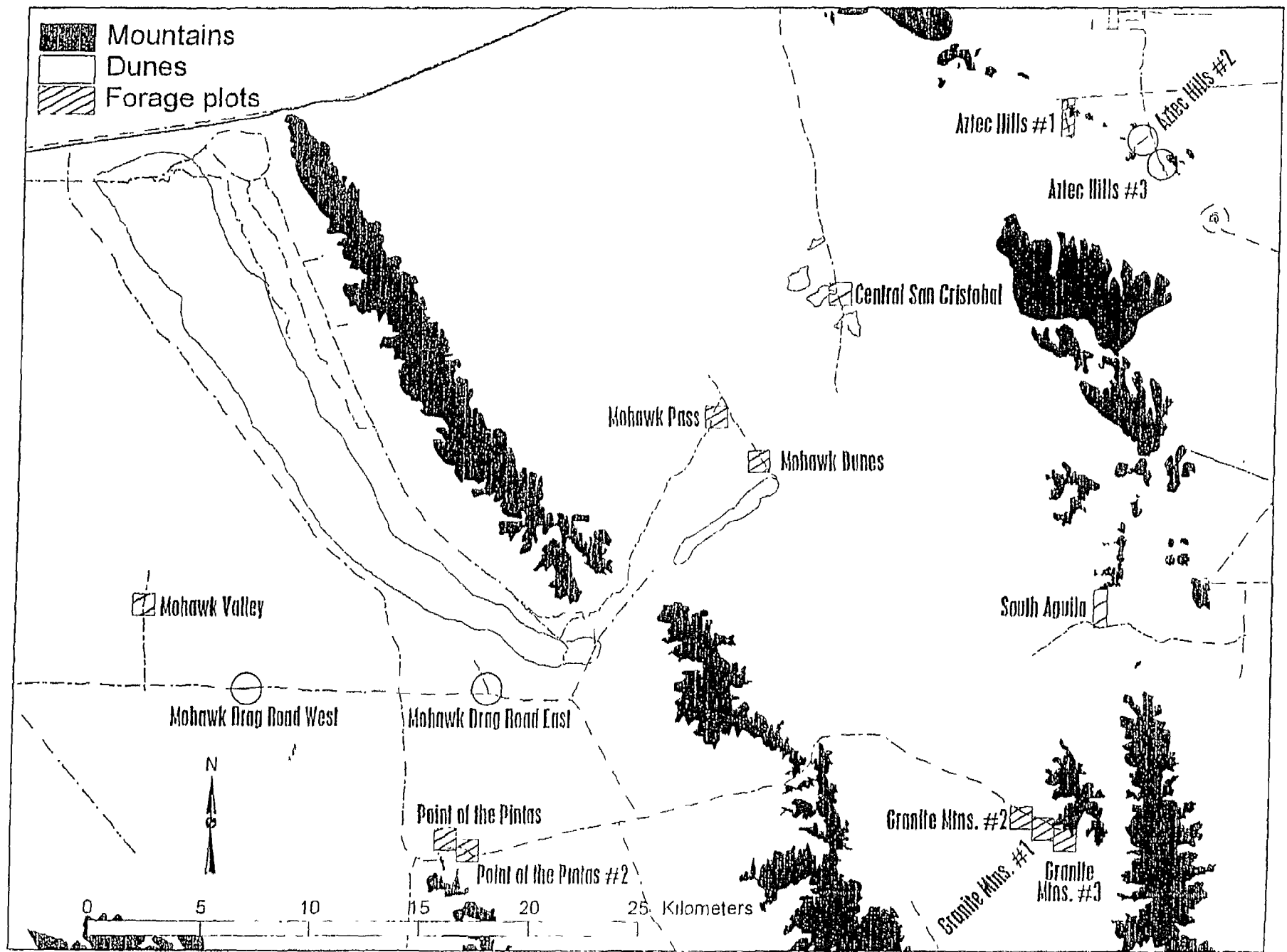
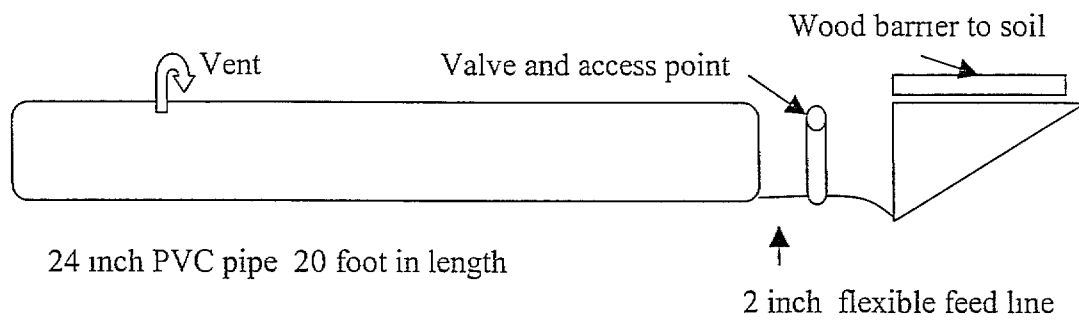


Figure 3 Map of proposed forage enhancement sites under Alternative B



Trough would be made of fiberglass and would be fitted with concrete walk-in steps. The depth of the trough would equal 30 inches.

Figure 4. Schematic drawing of an underground temporary pronghorn water

APPENDIX A

HYPOTHESIS TESTING AND MONITORING

Hypothesis Testing:

1. H_0 : *There is no difference in forage production between treated and untreated plots*

At each forage enhancement site, an adjacent untreated plot will be used for comparison. Transect sampling for annual plant availability will be conducted on treated and untreated plots. Differences in frequency and/or biomass will be analyzed using *t*-tests, Analysis of Variance (ANOVA), or appropriate non-parametric tests. Differences in forage production between treated and untreated plots and between treatments will be analyzed.

2. H_0 : *Sonoran pronghorn use treated (enhanced) areas randomly.*

Paired plots (treated and untreated areas) will be located within similar habitat types. Frequency of use of each plot will be documented by direct observation of radio-collared pronghorn. Chi-square analyses will be used to determine if pronghorn use treated areas in proportion to their availability (Neu et al. 1974, Byers et al. 1984). If use differs from availability, we will then determine which areas were preferred or avoided using 95% Bonferroni confidence intervals following methods described by White and Garrot (1990:186-189). A Jacobs' D test will be performed to determine the magnitude of selection or avoidance.

3. H_0 : *Sonoran pronghorn fawn survival is not influenced by habitat manipulations (creosote removal, forage enhancement and free standing water).*

Fawn survival will be estimated at any given time through direct observation of fawns within radio-collared groups. Marked groups in the vicinity of the treated areas will be compared to marked groups elsewhere. Rainfall data will be collected and used to compare treated and untreated areas. Differences in number of fawns surviving per 100 does between treated and untreated areas will be analyzed with *t*-tests or appropriate non-parametric tests.

4. H_0 : *Diet of Sonoran pronghorn is not influenced by forage enhancements*

Fecal pellets will be collected after direct observation, from pronghorn groups using the treated areas and those using other areas in similar habitats. Diet will be investigated through microhistological examination of fecal samples. Differences in the composition of forbs, browse and cacti in the diet of animals using treated and untreated areas will be compared on a seasonal basis. Differences in forage consumed will be analyzed using ANOVA or appropriate non-parametric tests. The nutritional quality of most forage species available to pronghorn is known. Consequently, a model can be derived reflecting any difference in the nutritional plane experienced by pronghorn using treated areas versus those that do not. Inferences will be made relative to the required nutritional plane for fawns to survive.

5. H_0 : *Predation of Sonoran pronghorn is not influenced by habitat manipulations (creosote removal, forage enhancement and free standing water).*

Predation will be documented through investigation of any mortality involving radio-collared pronghorn. Comparison of pronghorn mortality rates within treated and untreated areas will be investigated. In addition to the use of radio-collared pronghorn, systematic searches will be conducted in the vicinity of treated areas in order to determine if predators kill non-collared pronghorn.

APPENDIX B

ANTICIPATED WORK SCHEDULE

Creosote Burning

- One time treatment at each site.
- Done during the dry season. Creosotes should be brown and dry.
- Since it is the dry season, pronghorn are not expected to be in the plot areas. Each area will be scanned prior to beginning work to ensure there are no pronghorn around.
- Estimated Time and Personnel: 2 days with 4 people per 1 km² site.

Sprinkler Set-up

- One time set-up at each site.
- Set-up will be prior to pronghorn being in the vicinity. Areas will be scanned to ensure there are no pronghorn around.
- Estimated Time and Personnel: 2 people working each day
 - 2 days at Granite sites
 - 2 days at Aztec Hill sites
 - 1 day each for Pintas, Mohawk Pass, and Mohawk Dune

Well Drilling

- One time drilling at each site.
- Drilling will be done prior to pronghorn being in the vicinity. Areas will be scanned to ensure there are no pronghorn around.
- Estimated Time and Personnel: 4 days at each site
 - Crew required by the drilling company

Well Irrigation

- Irrigation will be done at night to reduce disturbance to pronghorn.
- One site irrigated per night.
- Estimated Time and Personnel: 1 person to start the well and monitor irrigation.
- Apply 1" of water over two acres will take approximately 10 hours, at 100 gallons/minute well output.
- Number of times to irrigate will depend on rainfall patterns; in the worst-case scenario of no additional rainfall, 8-10 applications will be necessary.

Water Truck Irrigation

- Done at night to reduce the likelihood of disturbance to pronghorn.
- One site irrigated per night.
- Estimated Time and Personnel: 1 person to drive the truck and connect truck to sprinkler
- Up to 2 trips a night (back and forth to water) until required amount of water has been applied.

Pronghorn Use of Plot Monitoring

- The majority of pronghorn monitoring will be done from aircraft.
- Remote cameras may also be used.
- Where possible, direct monitoring from hills may be used.

APPENDIX C

CULTURAL RESOURCE SURVEY SUMMARIES

This appendix contains the cultural resource survey summaries that were conducted for the proposed forage enhancement plots. One report, from the Air Force archeological contract, covers 8 of the 10 plots (Aztec Hills #1-3, Granite Mountains #1-3, Mohawk Pass and Mohawk Dunes). The Bureau of Land Management's Cultural Resource Project Record covers the Point of the Pinta's #1 and #2.

EXECUTIVE SUMMARY

Agency: United States Air Force, Luke Air Force Base, 56 Range Management Office (RMO)

Project Title: Archaeological Survey of Eight Pronghorn Forage Plots on the Barry M. Goldwater Range (BMGR)

Contract Number: F022604-99-D0002; DO 5004

Project Description: The study of eight pronghorn forage plots was funded by the U. S. Air Force and was undertaken at the request of the 56 RMO. The purpose of the study was to provide the U. S. Air Force, as the lead agency, the Arizona Game and Fish Department, and the BLM-Yuma with information regarding the nature, extent, and condition of cultural resources that are present in eight forage plots in three locations on the east side of the BMGR. The BLM-Yuma prepared the Environmental Assessment of the entire project, which also includes forage plots on the west side of the BMGR. Plots on the west side of the BMGR were surveyed by the BLM-Yuma and are not included in this summary.

Project Location: The eight forage plots are located in three general areas on the east side of the BMGR. The majority of the project area is located in relatively flat portions of the San Cristobal Valley in Maricopa County, Arizona. The three northernmost plots are located in the Aztec Hills, in Township 8 South, Range 11 West, Sections 10, 11, 14, 15, and 24 and Township 8 South, 10 west; Section 19. Two plots are located in the middle portion of the project area, on the west side of San Cristobal Wash. The Mohawk Dunes plot is location in Township 10 South, Range 12 West, Section 4 and the Mohawk Pass plot is located in Township 9 South, Range 12 West, Sections 29 and 32. Finally, the southern survey area includes the three largely contiguous Granite Mountain plots, located in Township 11 South, Range 11 West and the adjacent unsectioned area.

Number of Acres Surveyed: 1,665 acres

Personnel and Dates of Fieldwork: Fieldwork was conducted during two sessions: May 15-June 16, 2000 and July 22 and 23, 2000. A total of 93 person days were expended on the field survey and recording. Participants included Dr. Jeffrey H. Altschul, principal investigator, Dr. Teresita Majewski, project manager, Christopher J. Doolittle, project director, Kholood Abdo-Hintzman, Ted Perkins, and Tracy Franklin, field supervisors, and crewmembers Maria Espinoza, Perla Jauregui, Michael Oberndorf, Tina Oglesby, John Turkoc, and Nicole Wallock.

Number of Properties: Two (2) archaeological sites and 52 isolated occurrences were identified and recorded during the survey

List of Properties Recommended as Eligible: Two archaeological sites are recommended as eligible for the National Register of Historic Places (NRHP) under Criterion *d*, for their potential to yield information on the topics of chronology, settlement, trade routes and organization of

exchange, cultural affiliation and ethnic boundaries.

AZ Y:6:43 (ASM) is a large diffuse artifact scatter consisting of several loci that combined measures roughly 320 m north-south by 340 m east-west. The site occurs in an area that contains a small dune and several associated low-lying areas or playas. Four discrete loci were recorded. Artifacts include flaked stone, two projectile points, and ground stone. Preliminary analysis of the two projectile points suggests that the site may date to the Archaic period. The site has the potential for buried cultural deposits.

AZ Y.11.23 (ASM) is an artifact scatter that measures 64 m north-south by 68 m east-west. The site consists of one artifact concentration and several individual artifacts. Artifacts include plain ware ceramics, cortical and noncortical flakes and shatter, ground stone, and a *Glycymeris* shell fragment.

List of Properties Recommended as Ineligible: 52 isolated occurrences. The isolated occurrences have good integrity; however, beyond their locations and nature, they do not appear to contribute information to the research questions outlined for this project. Twenty-four (24) isolated occurrences were recorded with only flake stone artifacts; six (6) contained only shell; two (2) had both flaked stone and shell artifacts, eleven (11) contained only ceramics, four (4) had only ground stone artifacts; four (4) were prehistoric isolated features, including two trail segments; and one (1) was a historical-period feature.

Comments: The survey crew walked linear transects spaced at 15-m intervals. ASM criteria were applied to identify “sites” versus “isolated occurrences”. Site-recording procedures were comprehensive and identical for sites and isolated occurrences. Information recorded for sites included topography and environmental setting, artifact counts and descriptions, feature descriptions, site size, evidence of human and natural disturbance, and location data. Each site was mapped, showing size, environmental setting, point locations of important artifacts, and spatial relationships between features and artifact concentrations. Color and black-and-white photographs were taken to document site condition and environmental setting. The locations of sites and isolated occurrences were determined using a Trimble GeoExplorer II GPS unit with post-processing differential correction.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE

CULTURAL RESOURCE PROJECT RECORD

Project - Number: BLM AZ - 050 - 99 - 17 Other No.: _____
Project - Name: MCAS Antelope Forage Project BLM Case File No.: _____
State: AZ / CA County: Yuma Map Name(s): 1- East of Buck Peak; 2- North of Isla Pinta,
and 3- Point of the Pintas

Township not surveyed (N S), Range (E W) Section QQ Q
Township (N S), Range (E W) Section QQ Q
Township (N S), Range (E W) Section QQ Q
ASM Quad No(s): Y-10 NW, Y-10 NE, Y-9 NE
Land Owner(s): Federal County Other Private State Unknown

Agency: BLM and Yuma Field Office and PU

Institution Doing Work: BLM, Yuma Field Office
Person(s)-in-Charge: Boma Johnson, Archaeologist
Purpose of Project and Applicant: _____
Dates of Fieldwork: 11/29/99 - 11/30/99 Total Person Days Used: 192*
Cultural Use Permit No.: N/A
Access and Location Description: located on the Barry M Goldwater Range
Bibliographic Reference(s) (list report title, author, institution and date): none
No. of Cultural Properties Recorded: none List Site Nos. none
Collections Made: YES NO Testing Done: YES NO
Repository Name and Location: N/A
Photos: YES NO Photo Information: none

*A crew of 12 people assisted Boma Johnson and Susanna Henry to accomplish the field inventory.

*One single red slip on buff sherd (5x6 cm.) was noted in the middle of Unit 2 at E251736 and N3590974. Also a rock cairn was noted (likely historic) just outside plot or Unit 2 at the southwest corner.

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CULTURAL RESOURCE PROJECT RECORD

Project - Number: BLM AZ - 050 - 99 - 17

INVENTORY TECHNIQUES (if different parts of the project used different techniques, fill out a separate page for each):

Size of Entire Project Area (acres): Plot 1: 1000x1000m
Plot 2: 1000x1000m.
Plot 3: 10x500m
Plot 4: 10x50m ⁵⁰⁰ ₀ Crew Size: 14
Project Boundary Description: see maps

Mode: Pedestrian Dimensions (miles or feet): 2020x3000 meters
Inventory Level (check): Class II* Class III x Judgmental*
Actual Acres Surveyed - Estimated % Coverage: 100 %

Field Methods Used (for example, systematic 50 m wide parallel transects, etc.): 20 meter transects

Discussion (justify techniques and methods used): N/A

***SAMPLING INFORMATION**

Sampling Strategy (check): Systematic , Random , Stratified , Combination
Percent of Project Area Sampled: %

Size of Sample Units: No. of Sample Units:

ENVIRONMENTAL DATA (optional if covered in report or other document):

Vegetation Types: creosote/bursage
Major Topographic Features and Locations: area very flat
Water Sources and Locations: none
Other:

Form Completed by: Borna Johnson Date: 12 / 7 / 99

Approved by: Date: / /

Attach map(s) showing site locations, site numbers, project area boundary, all areas surveyed, and sample units and numbers, if applicable.

APPENDIX D

COMMENT LETTERS RECEIVED

and

RESPONSES TO COMMENTS

The following comment letters were received during the open public comment period which took place from February 2, 2000 until March 24, 2000:

<u>Letter No.</u>	<u>Author</u>
1	Edward B. Zukoski, Land and Water Fund of the Rockies
2	Mike Senator, Defenders of Wildlife
3	Bill Broyles, Friends of Cabeza
4	John Gunn, Southwest Natural Resource Management Consultants (SWNRMC)
5	Jon M. Shumaker
6	Scott Jay Bailey, Tohono O'odham Nation, Natural Resources Department
7	Gail Gallagher, Yuma County Department of Development Services
8	J.P. Melchionne
9	Brian F. Dolan
10	Mike Seidman
11*	Duane Shroufe, Arizona Game and Fish Department
12*	Russel T. Farringer, III, Department of the Air Force, HQ AETC/CEVN Randolph, Texas
13*	William D. Sommers IV
14*	Jon Fugate, Yuma Valley Rod and Gun Club
15*	Dale M. Marler, Yuma Chapter, People for the USA

* Comment letters not requiring responses

This appendix contains a copy of each of the comment letters followed by responses to the comments.

① LAND AND WATER FUND OF THE ROCKIES

March 24, 2000

Ms. Gail Acheson
Yuma Field Office Manager
2555 E. Gila Ridge Rd.
Yuma, AZ 85365-2240
VIA FAX: 520-317-3250

Re: Sonoran Pronghorn Habitat Forage Enhancement,
BLM EA: AZ-050-99-045

Dear Ms. Acheson:

On behalf of The Wilderness Society (TWS), its thousands of members in Arizona, and its hundreds of thousands of members across the nation, please accept these comments on the Draft Environmental Assessment (DEA) for the Sonoran Pronghorn Habitat Forage Enhancement Project (EA-AZ-050-99-045). TWS has a longstanding interest in the protection of the wild areas of the Sonoran Desert and the wildlife that reside there. TWS is also committed to the recovery of federally listed threatened and endangered species using responsible, ecologically appropriate, and scientifically defensible recovery strategies.

However, TWS opposes the implementation of this project as currently conceived. Before a project of this magnitude with unproven and potentially significant negative environmental impacts is undertaken, TWS urges the BLM to:

- (a) analyze and adopt a much more modest study to determine IF artificial habitat manipulation CAN result in the successful growth of additional forage palatable to Sonoran pronghorn antelope; and
- (b) then and only then CONSIDER the implementation of a more ambitious experiment after the preparation of an ENVIRONMENTAL IMPACT STATEMENT.

I. BLM Must Analyze and Adopt A More Modest Proposal.

TWS supports the recommendation of Defenders of Wildlife (DOW) in their comments (submitted separately) that BLM should first construct and operate a forage enhancement plot or plots outside of pronghorn habitat on the Goldwater Range. The purpose of these plot(s) should be to gather the details

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March 24, 2000

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associated with the construction and operation of the plots (i.e., cost, personnel requirements, time, amount of disturbance) and, most importantly, to determine whether watering the desert and throwing out a few seeds will succeed in producing an appropriate quality and quantity of forage. This experimental plot may have to be operated for an entire year, or more likely, even longer, so that the agencies can ascertain the effectiveness of the plot during different seasons.

BLM should take this approach because there is no evidence that we know of -- and BLM cites none -- that the methods it proposes to use will result in an increase in forage for Sonoran pronghorn or any other species. In fact, expert botanists (e.g., Dr. Richard Felger) who have reviewed the proposal expressed grave skepticism as to its success. According to the comments of Bill Broyles (submitted separately) Dr. Felger

predicts this project will cause irreparable harm to an extensive region of fairly pristine desert. He tells us that this project opens an enormous door for non-native invasive species, many of which out-compete natives. He contends that these desert feedlots have little botanical chance of success, especially if the native seeds to be used are not a compatible local genotype.

Mr. Broyles also asks a number of important questions concerning forage enhancement, as does Defenders of Wildlife, that BLM must answer before it can proceed with any seeding/watering experiment.

Other questions regarding forage "enhancement" include:

- BLM intends to apply water "frequently enough to enhance the level of forage production to meet the specific goals for each plot..." DEA at 6. What are the specific goals for each plot? Do they vary from plot to plot? How? Why? Does BLM have an idea how "frequently" water will have to be applied to achieve a specific goal?
- "In areas where natural germination has not produced enough forage, seeding will be used." DEA at 6. How much is "enough" forage? After how much water has been applied will this determination be made? At what time of year will such a decision be made? Will the BLM foreclose opportunities to seed for certain species (because of the timing of germination) by applying the water first and seeding later?
- "Sonoran desert native seed mixtures ... would be used." DEA at 6. Where will the seed come from? Will BLM attempt to gather seed from the local area? Why or why not? How many of the plants listed are: Natives? Annuals? Perennials? At what time of year do they usually germinate?

BLM fails to disclose where it will obtain its seed source. BLM must correct this omission in any subsequently prepared NEPA document.

ENVIRONMENTAL LAW AND POLICY CENTER
SERVING THE ROCKY MOUNTAINS AND DESERT SOUTHWEST

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- Will BLM attempt to evaluate specific soil conditions before planting seeds?
8 | Don't different seeds have different soil requirements, depth requirements, etc.?
- How often will the plots be watered? How often (and how many) trucks will
drive out to each site?

We note that the "List of Preparers" (DEA at 19-20) lists no person who, to our knowledge, has significant *experience or expertise* in the botany of the Sonoran desert. The list of citations (DEA at 20-22) contains but three studies -- Patten (1978); Brown and Minnich (1986); and Tevis (1958) -- out of nearly 30 cited that have arguably anything to do with plant ecology, and none of these apparently pertains to the efficacy or possibility of artificially germinating perennial or annual plants in the Sonoran desert. At an absolute minimum, BLM must consult with leading Sonoran desert botanists (including Dr. Richard Felger) before it proceeds with even a limited study to determine if artificially germinating or enhancing forage species is practical on such a scale.

We further note that BLM's ability to test *all of its other hypotheses* (numbered 2-5 in Appendix A to the DEA) depend entirely on its ability -- totally unsupported and unproven at this point -- to produce forage. If BLM fails in its attempts to artificially germinate or supplement the growth of plants on many or all of its 15 forage plots, it will generate NO useful data on those plots in answering those other questions. In particular, how can BLM determine if Sonoran pronghorn fawn survival is influenced (or not) by enhancement of forage, if BLM is unable to produce the desired forage? If BLM does not produce forage in a small test outside of Sonoran pronghorn range, the costs of the experiment (to the taxpayer, to the agency in terms of staff-time, to the environment, etc.) will be small. On the other hand, proceeding in a hurried fashion with the proposed action, involving large-scale habitat manipulation on approximately 4 square miles, with no science or experience that the BLM can improve forage production at any of 15 sites could have potentially significant cost, and little return.

As the above demonstrates, the alternative of examining the BLM's ability to artificially enhance forage on a small-scale, experimental basis is reasonable one, since it will provide useful information and expertise in determining whether a larger-scale project is practical or feasible. As you know, central to the preparation of an environmental assessment is the requirement that it consider a meaningful range of reasonable alternatives. 40 C.F.R. § 1508.9(b); Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228-29 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989) ("Consideration of alternatives is critical to the goals of NEPA even where a proposed action does not trigger the EIS process"); Natural Resources Defense Council v. U.S. Dept. of the Navy, 857 F.Supp. 734, 739-40 (C.D. Cal. 1994) (duty to consider reasonable alternatives is independent and of wider scope than the duty to complete an EIS); Sierra Club v. Watkins, 808 F.Supp. 852, 870 (D.D.C. 1991) (same); Sierra Club v. Alexander, 484 F.Supp. 455 (N.D.N.Y. 1980) (same). Although an agency need not consider every possible alternative, it must consider reasonable alternatives "necessary to permit a reasoned choice." Headwaters, Inc. v. Bureau of Land Management, 914 F.2d 1174, 1180-81 (9th Cir. 1990). Put differently, it must consider those alternatives that "would alter the environmental impact and the cost-benefit balance." Bob Marshall Alliance, 852 F.2d at 1228, quoting Calvert Cliffs.

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Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n., 449 F.2d 1109, 1114 (D.C. Cir. 1971)

BLM's failure to analyze this more modest approach would violate NEPA.

II. BLM Must Prepare an EIS on the Proposed Action.

NEPA requires that federal agencies complete a detailed environmental impact statement when planning a major federal action which may significantly affect the quality of the human environment. 42 U.S.C. § 4332. Council on Environmental Quality (CEQ) regulations define "major federal action" to include "actions with effects which may be major and which are potentially subject to Federal control." 40 C.F.R. § 1508.18 (emphasis added). Regulations further define "significantly" in terms of context and intensity. 40 C.F.R. § 1508.27. Federal caselaw further makes clear that where the *potential* for significance occurs, whether or not it is proven, the agency must prepare an EIS. See Foundation for North American Wild Sheep v. United States Dept. of Agriculture, 681 F.2d 1172, 1178 (9th Cir. 1982); Sierra Club v. Marsh, 769 F.2d 868, 870 (1st Cir. 1985).

As the Second Circuit recently stated:

... when it is a close call whether there will be a significant environmental impact from a proposed action, an EIS should be prepared. This view is reinforced by the CEQ Guideline's direction to agencies to consider "[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial" when determining significance. 40 C.F.R. § 1508.27(b)(4). Moreover, we think NEPA's policy goals require agencies to err in favor of preparation of an EIS when the proposed action is likely to have a significant environmental impact. Consequently, we agree with the district court that a party challenging the agency's decision not to prepare an EIS must show only that there is a substantial possibility that the action may have a significant impact on the environment, not that it clearly will have such an impact. See Foundation for N. Am. Wild Sheep, 681 F.2d at 1177-78; Save Our Ten Acres, 472 F.2d at 467. The Forest Service's determination that preparation of an EIS was not necessary, based on the record before it, was therefore arbitrary and capricious."

National Audubon Society v. Hoffman, 132 F.2d 7, 18 (2nd Cir. 1997)

By several measures, the proposed action requires completion of an EIS

10 | First, the proposed action and at least one other alternative will significantly impact the human environment. The proposed action will involve, among other things:

- 10A | habitat manipulation, including burning of large numbers of plants, on an area
nearly 4 square miles (2,485 acres) (DEA at 5).
- 10B | construction of up to 50 "small" dams (DEA at 7).

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- In short, this project involves substantial manipulation of habitat with unknown benefits and potentially significant harm to the environment. DLM must therefore prepare an EIS.

The DEA also states that the project will be discontinued if "it can be shown that these efforts are not effective." DEA at 5. However, while this experiment attempts to test the veracity of certain hypotheses, the DEA divulges no threshold levels at which the experiment will be judged either a failure or a success. This is a major failure of the experimental design that must be remedied, and must be presented to the public for comment.

For example, one measure of significance is the "degree to which the effects on the quality of the human environment are likely to be highly controversial." 40 C.F.R. § 1508.27(b)(4). Federal courts have held that where conservation groups, scientists, and other interested parties have reached different conclusions than the agency concerning the potential impacts of a project, that constitutes a "highly controversial" action for which an EIS must be prepared. Foundation for North American Wild Sheep, 681 F.2d 1172 (9th Cir. 1982). That threshold has been reached here, given that experts (including Mr. Broyles, with several, peer-reviewed, published articles on the history and impact of water in the desert southwest - none of which BLM bothered to cite³), conservationists (Defenders of Wildlife) and others (e.g., Mr. Gwyn) all raise numerous questions about the nature of the impacts and recommend against the proposed action.

13 Yet another measure of significance is the "degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration." 40 C.F.R. § 1508.27(b)(6) TWS knows of no precedent for the proposed action. BLM cites none. While supplemental feeding of game animals is a common practice in some states, the purposeful development of forage plots and artificial water sources to aid in the recovery of a listed species has not ever, to our knowledge, been attempted. As a consequence, this project, particularly if successful, will set a dangerous precedent of using habitat manipulation practices to create artificial habitats to aid in the recovery of listed species. Thus, instead of relying on the establishment of critical habitat, preparation of conservation agreements, or similar strategies to protect and preserve the habitat of a listed species, recovery may be achieved in the future without such potentially controversial decisions by engaging in habitat manipulation to maximize the number of individuals from a listed species who can exist on the smallest piece of habitat possible.

The precedent, good or bad, which may be established if the proposed project is implemented and successful must be evaluated in an EIS. It is imperative that the agencies and the public understand the potential precedent of this project and if or how it may impact other recovery efforts in order to prepare substantive and informed comment on the proposal.

14 Another measure of significance is "[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts." 40 C.F.R. § 1508.27(b)(7). We

The BLM must address or acknowledge Mr Broyles 1995 work, [Broyles, Wm. Desert Wildlife Water Development: Questioning Use in the Southwest, Wildlife Society Bulletin 1995, 23(3): 663-675]. Given the relevance of that study to the discussion of impacts of water developments proposed here, the agency's failure to cite that article is astonishing.

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agree with Defenders of Wildlife and others that cumulative impact analysis in the DEA is inadequate. The BLM has elected to simply list some of the activities which occur on the range but failed to subject the litany of agency activities to cumulative impact analysis. A cumulative impact, as defined by NEPA, is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. §1508.7. Providing a sufficient cumulative impact analysis is critical to aiding the public and decision-makers in understanding the full range of impacts associated with the proposed project.

A proper analysis of the cumulative impacts of the proposed action would consider the impacts of the action in relationship to other past, present, and foreseeable future activities on the range which may impact the pronghorn. The agencies should evaluate the impact of forage plots on pronghorn mortality in relation to other range activities that influence pronghorn mortality. Similarly, the potential disturbance associated with the proposed project should have been analyzed in light of existing disturbance factors associated with agency or public use of the range.

Federal caselaw makes clear that more than a mere list is required. In Neighbors of Cuddy Mountain v. United States Forest Service, 137 F.3d 1372, 1379 (9th Cir. 1998), the Ninth Circuit further held that:

[I]n accord with NEPA, [a federal agency] must "consider" cumulative impacts. 40 C.F.R. § 1508.25(c). To "consider" cumulative effects, some quantified or detailed information is required. Without such information, neither the courts nor the public, in reviewing the [agency's] decisions, can be assured that the [agency] provided the hard look that it is required to provide.

Emphasis added. BLM has provided no such quantified or detailed information on the cumulative impacts to the public in the present case. Thus, neither the courts nor the public can be assured that BLM has provided the hard look which NEPA requires it to provide. Since "[g]eneral statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided," the BLM has not satisfied NEPA regarding the cumulative impacts analysis. Id.

In regard to future activities, the agencies have to consider, at a minimum, the potential development of additional forage plots and the need to radiocollar additional pronghorn in their cumulative impact analysis.

In addition, the DEA contains no mention of at least two ongoing activities and one proposed action which, together with the proposed action, may have cumulative impacts on pronghorn or other resources. First, the BLM is now undertaking an analysis of the transportation system on the BMGR. It is quite possible that some of the routes off of which the forage plots will be constructed, or which are intended for use to haul water, would otherwise be closed to all uses and revegetated were it not for this project. Thus, one of the impacts of this project may be to prejudice the decision as to which travel routes will remain open. The BLM

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and other agencies must therefore examine the potential impact of the proposed action on the transportation system.

15 Second, the DEA contains no mention of the location of the proposed forage enhancement plots in relation to ongoing military activities, particularly military training routes (MTRs). It is possible that some of these plots may be located directly under or adjacent to MTRs used for extreme low-level (helicopter down to 50' above ground level (AGL), fixed wing down to 200' AGL) or supersonic flight. These types of overflights generate the most noise, the most surprise, and thus the most potential disturbance to Sonoran pronghorn. Any subsequently prepared NEPA document must disclose the location of the forage enhancement plots in relation to ongoing and proposed military air and ground activities. We highly recommend that BLM provide maps displaying the location of these activities. It would indeed be unfortunate if the forage plots ended up being Sonoran pronghorn to areas where they were most disturbed by military operations.

16 Third, the DEA contains no mention of the extent to which the Border Patrol or other law enforcement agencies use the routes off of which the forage plots will be constructed. Any subsequently prepared NEPA document must address this potential cumulative impact, and must disclose the the purpose, nature and extent of law enforcement use of the routes.

17 In addition, BLM discusses in passing, but never analyzes the impacts of, a connected action which is a major rationale for, and which would likely follow the success (if any) of, the proposed action. BLM proposes that these forage enhancement plots will continue for a decade or more, until other populations of Sonoran pronghorn are established through transplantation. See DEA at 5 and footnote 2, above. Yet, the DEA contains absolutely no discussion of how, when, or where these populations will be established. In any subsequently prepared NEPA document, a full analysis of the impacts of transplanting Sonoran pronghorn must be discussed. At a minimum, the transplantation of Sonoran pronghorn has potential cumulative impacts that BLM must disclose in any subsequently prepared NEPA document.

18 Finally, the AGFD and BLM have, with respect to artificially provided water, begun to argue that such provided water cannot ever be eliminated because illegal aliens have come to depend on such water for survival. BLM must therefore analyze the cumulative impact of illegal alien use of the area, and the extent to which aliens may come to rely on the water.

III. Some Questions about Provided Water.

19 In its draft analysis of the Goldwater East Habitat Management Plan, the BLM argued that a huge number of new artificial water developments were needed because certain ungulates had come to depend on them for survival. BLM must therefore address in any subsequently prepared NEPA document the extent to which the proposed action may result in the creation of a subpopulation of Sonoran pronghorn who come to depend so heavily on the enhance forage plots at certain time of the year that they too will come to depend on these artificial habitats and may be unable to survive without them, even if transported to other areas.

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IV. Response to Comments and Notification of Appeal Rights.

We urge BLM to include in any subsequently prepared NEPA document the following:

1. A detailed response to each comment submitted by the public. This will enable the public to determine how and why BLM modified its NEPA document to address public input. In particular, TWS believes that Mr. Broyles, DOW, and Mr. Gunn in their comments all raise significant questions and concerns that BLM must address publicly before it can proceed with any additional NEPA compliance, let alone any action.
2. ^{a1} Notification of the public's right to protest, appeal, or litigate the proposed action. This will ensure that members of the public understand their rights to challenge this proposal if BLM fails to modify it to conform with law, science and common sense.

V. Other Comments.

- 22 Why is FWS not mentioned as part of the Sonoran Pronghorn recovery Implementation Team (DEA at 3)? Why aren't the NGOs who were invited to participate? Have they been kicked off?
- 23 The DEA at 3 mentions the Holowill Tank as a previous attempt to provide artificial water for pronghorn. Did it work? If it did (or didn't), why (or why not)? If the agencies are involved in experiments on the BMGR that result in no useful data, why are they forging ahead with another one?
- 24 Are the 14 plots identified in the DEA the only possible locations for the construction of food plots? Why is the magic number 14 (instead of 13, or 10)? And if there are 14 other places food plots could be constructed, why not consider that as an alternative?
- 25 The DEA at 5 indicates that all of the construction, road use, camping, etc., necessary for the construction and monitoring of these plots will occur "near the areas pronghorn are using." What will be the impact of all this activity while Sonoran pronghorn are near? Why will the BLM attempt habitat manipulation in areas the Sonoran pronghorn already seem to be using (indicating they may have a special values for the animals)?
- 26 Will monitoring results be published? How often? Will they be reviewed by the agency periodically? How often will such a review occur so that the agency will be forced at one time or another to reach a conclusion as to whether the plots are achieving their predicted goals or not?
- What, exactly, are the measures of success or failure for this proposed action? While some types of measurements and analysis are discussed in Appendix A, no discussion is provided as to what level those parameters must achieve before success or failure is achieved. The public and the agencies thus have no idea how success or failure will be determined. Nor does the

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- 26 study protocol indicate how confounding factors (weather, predation in other areas, other factors affecting SPIH survival at other locations) will be sorted out so that the true impact (if any) of these plots can be determined.
- 27 Does the BLM or other federal agency hold any rights to remove groundwater from the aquifer (DEA at 8)? Is a state process or permit required before drilling can begin?
- 28 Why does the EA contain virtually NO site-specific data about each of the plots? Each of these areas is different, unique, and for the most part natural, and the naturalness will be degraded by these actions. At a minimum, we suggest that BLM provide several photos of the areas so that the public may have some information about the values that will be lost under the proposed action.
- 29 The discussion of artificially provided water (DEA at 14) fails to cite or address adequately information concerning the detrimental impacts of the same as disclosed in Broyles 1995 article (as discussed above). Any subsequently prepared NEPA document must address the study and the issues it raises.
- 30 Despite the fact that European honeybees "are already well established in southwestern Arizona," DEA at 14, will this project benefit such bees? What is the impact of further benefiting European honeybees at the expense of native pollinators? The DEA contains no discussion of such impacts.
- 31 The DEA indicates that no construction will take place in wilderness. However, given that BLM has failed to inventory the Goldwater Range for wilderness under Section 603(c) of FLPMA, that conclusion is not a surprise. However, this project may destroy some of the natural values of ROADLESS areas. As noted above, BLM is now engaged in an inventory which may result in the elimination from the transportation system of existing routes, including, potentially, those off of which some of the forage plots will be constructed. BLM must address these issues in any subsequently prepared NEPA document.

CONCLUSION.

TWS opposes the implementation of this project as currently conceived. Before a project of this magnitude with unproven and potentially significant negative environmental impacts is undertaken, TWS urges the BLM to.


- (a) analyze and adopt a much more modest study to determine IF artificial habitat manipulation CAN result in the successful growth of additional forage palatable to Sonoran pronghorn antelope; and
- (b) then and only then CONSIDER the implementation of a more ambitious experiment after the preparation of an ENVIRONMENTAL IMPACT STATEMENT.

Letter to Ms. Acheson re. TWS Comments on BLM EA AZ-050-99-045
March 24, 2000

Page 11

Thank you for this opportunity to comment. If you have any questions in this matter, please contact me at 303-444-1188 x213, or Ms. Pamela Eaton of The Wilderness Society at 303-650-5818 x103

Sincerely,


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Attorney for The Wilderness Society

Cc: Bill Broyles, FOCP
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March 23, 2000

RECEIVED YUMA, ARIZONA

Ms. Gail Acheson
Yuma Field Office Manager
2555 E. Gila Ridge Road
Yuma, Arizona 85365-2240

Dear Ms. Acheson:

On behalf of the 380,000 members of Defenders of Wildlife (Defenders), including 7,000 members who reside in Arizona, I submit the following comments on the Draft Environmental Assessment (DEA) for the Sonoran Pronghorn Habitat Forage Enhancement Project (EA-AZ-050-99-045).

The Endangered Species Act (ESA) specifies that agencies must do everything in their power to recover federally listed species. This mandate, however, was not intended to allow agencies to forgo the implementation of tried and proven recovery strategies in favor of more radical, untested, and potentially dangerous strategies which may be more palatable to the interests of the agencies. In this case, pronghorn recovery will only be achieved if there is sufficient habitat subject to minimal human disturbance available to the animals. While, in an ideal world, setting aside the Goldwater range in its entirety as a permanent sanctuary for pronghorn would be preferable, Defenders has never advocated this approach to pronghorn recovery. Rather, Defenders has advocated a substantial modification of human use of the range, including military use, to provide increased protection to pronghorn and their habitat, particularly during the spring and summer months which are so critical to pronghorn fawns.

Defenders is concerned, however, that the proposed recovery strategy is supported by certain agencies because they are more concerned about convenience than true recovery. These particular agencies have demonstrated little interest in implementing substantive changes in their land use management practices to help recover the pronghorn. Instead the agencies prefer to support alternate strategies -- like the current proposal -- which contain a number of unknown risks, but which are perceived as potentially permitting the agencies to continue to manage the range without substantive change. Furthermore, Defenders believes that the military agencies are supportive of the current proposal primarily because forage plots, if successful, will shortstop pronghorn reducing their occupation of military target areas thereby increasing the availability of these sites for training exercises.

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1 | Additional detail is required in the DEA to ensure that the public understands the
proposal and can prepare substantive comments on the environmental impacts of the proposed
2 | action. Furthermore, the range of alternatives offered should be expanded to reflect a reasonable
range of alternatives as required by the National Environmental Policy Act (NEPA). Finally, the
analysis of environmental impacts should also be more detailed as the DEA fails to consider
many of the direct, indirect, and cumulative impacts inherent to the proposed project -- impacts
which may cause greater harm to the Sonoran pronghorn compared to the no-action alternative.

Defenders encourages the agencies to take a more cautious and methodical approach to
study the details and impacts of a limited number of forage plots before possibly expanding the
forage plot network as proposed in the DEA. To facilitate this approach, Defenders supports a
limited version of the proposal outlined in the DEA as summarized as follows:

3 | A. Construct and operate a forage enhancement plot outside of pronghorn habitat on
the Goldwater Range. The purpose of this plot is to gather the details associated with the
construction and operation of the plots (i.e., cost, personnel requirements, time, amount of
disturbance) and to determine whether watering the desert will succeed in producing an
appropriate quality¹ and quantity of forage. This experimental plot may have to be operated for
an entire year so that the agencies can ascertain the effectiveness of the plot during different
seasons.

3 | B. Depending on the information obtained from the single experimental plot, the
agencies should either terminate the project or, pending appropriate environmental impact
analysis in a legally sufficient Environmental Assessment or Environmental Impact Statement,
proceed with the development of additional enhancement plots within pronghorn habitat.
Additional NEPA compliance is essential prior to any additional plot development to report the
results of the single plot experiment to the public and to provide the public with an opportunity
to understand and comment on the full range of impacts associated with forage plot development.

4 | C. The forage plots should be developed at those sites where traditional Tohono
O'odham farming methods can be utilized to create forage plots while minimizing environmental
impacts. These plots should only be used during those years when severe drought conditions
exist. Other techniques, as disclosed in the DEA, could also be used if successful in the single
experimental plot and pending environmental impact analysis.

D. The agencies' desire to create food plots for the pronghorn is part of a continuing
effort to manipulate the desert environment to make it more habitable and productive for a wide
variety of animals. In the past, these manipulations have been in the form of artificial water
sources. There is little conclusive evidence, however, that artificial waters are needed by or

5 | ¹Defenders is concerned about the quality of the water that the agencies propose to use to
water the forage plots. Consequently, the pilot plot analysis must include chemical analysis of
the forage produced on the plot to determine whether it contains dangerous levels of pesticides,
heavy metals, or other potentially toxic compounds.

6 | benefit desert wildlife (Broyles 1995), including pronghorn, and pronghorn use of these facilities
is negligible. Even the Arizona Game and Fish Department, a long-time proponent of artificial
waters, conceded that, due to study limitations, "knowledge of wildlife water development effects
rests on a shaky foundation" (Rosenstock et al., 1999). Even if there were conclusive evidence
7 | that artificial waters benefit wildlife, there remains a fundamental question of whether the
manipulation of the natural environment is acceptable. Indeed, the DEA itself states that the case
for artificial water developments is not proven. Defenders does not support the construction of
artificial water developments at the food plot sites.

Furthermore, it is essential that the agencies continue to identify and implement changes
to their own land and activity management practices to benefit the pronghorn.

1. The DEA must consider alternative strategies to recover the pronghorn.

8 | The tone of the DEA suggests that the agencies believe that this project is the only
legitimate means of recovering the population. However, for years, Defenders has advocated for
reasonable changes in the management practices of the agencies, particularly the military and
BLM, to benefit the pronghorn with only limited success.

Defenders is concerned that the proposed project will be used as an excuse by the
agencies to resist any additional changes to their management of the lands and activities under
their jurisdiction. While this may not be the intent of the agencies supporting the DEA, there is
not a single statement in the DEA to suggest that the agencies are considering and will continue
to consider other land management changes to aid pronghorn recovery. The reality is that there
is an abundance of management actions that each of the agencies could implement immediately
to benefit the pronghorn.

The BLM, for example, should retire the cattle allotments within the range of the
pronghorn and remove all fences. Not only is this habitat not ecologically conducive to cattle
grazing, but the miles of fences intended to contain cattle have likely prevented pronghorn from
using all potential rangeland. Though many of the fences have been modified to be pronghorn
friendly, there is no evidence that the pronghorn are aware of these modifications. If the
pronghorn have learned that these fences have historically been a barrier to movement, it is
unclear that the modification of a single wire will suddenly trigger pronghorn movements into
these previously off-limit lands.

9 | The military agencies, particularly the Air Force and Marine Corps, should immediately
cease all activities on S-Tac and N-Tac from February through June which encompasses the
pronghorn fawning period and the first several months of a fawn's life. This closure must apply
to all activities -- aerial and ground-based -- to effectively create a sanctuary for pronghorns
during this critical period of the year. Even supposing that the changes imposed to date by the
Air Force on the tactical ranges -- namely the implementation of a monitoring program -- have
benefited the pronghorn, this program is only as good as the number and skill of the observers
and it does not provide for the level of protection required by the pronghorn. Furthermore, while
the military may claim that low-level supersonic jet overflights do not have adverse impacts on

the pronghorn, a claim that has yet to be proven, bombing and strafing activities, helicopter use of the tactical ranges by the National Guard, and the myriad of ground based activities (i.e., ordinance clean-up, target establishment and repair, contractor activities, and research activities) continue to represent a direct and indirect threat to the well-being of the pronghorn¹

9 In addition to implementing actions beneficial to pronghorn recovery, the agencies must not permit actions inconsistent with pronghorn recovery. Road construction, expansion, or improvement (i.e., paving) should not be permitted within existing or potential pronghorn habitat. The proposed expansion of highway 85, particularly within the Organ Pipe Cactus National Monument must not be permitted. Increasing speed limits for vehicles on primary and secondary roads should also be opposed since this increases the risk of automobile/animal accidents for pronghorn and other wildlife.

10 Finally, all of the agencies which have jurisdiction over human use of the range should establish additional restrictions on when, where, and how the public can use the range. If an effective sanctuary is to be established for the pronghorn, particularly between February and June, human access to that land must be tightly controlled and restricted to minimize potential disturbance events.

If these and other reasonable changes were made to current management practices, yet pronghorn recruitment and numbers declined, then at that point there may be more merit to, and support for, the forage plot proposal. If the agencies intend to implement additional management changes to aid pronghorn recovery as a supplement to the forage plot project, then the DEA should contain a discussion of what additional management changes are being considered. In addition, the agencies should explain why the implementation of these changes should not precede the proposed construction of forage plots to determine if the latter, far more controversial effort, is even necessary.

3 2. The agencies should establish a test plot to gather the information necessary to provide sufficient detail about the proposed project to permit informed public comment.

8 The DEA claims that if the proposed project is not implemented "opportunities to improve habitat and recover the Sonoran pronghorn would be foregone." DEA at 8. There is no question that the Sonoran pronghorn is endangered, but to infer that this action is the last and only hope for recovery is misleading and demonstrates the agencies' unwillingness to examine their own actions. Indeed, if the no action alternative were selected, it would not prevent other important recovery strategies from being implemented.

¹Remarkably, Army Air National Guard helicopter training west of I-85, has apparently never been subject to review pursuant to either the NEPA or the ESA.

11 Indeed, the Air Force Biological Opinion which first contemplates the enhancement of forage production through supplemental watering calls for a test plot outside of pronghorn habitat.

As a first step, a series of treatments and controls would be laid out at a location outside the current known range of the pronghorn but within the BMGR [Barry Goldwater Range]. The objective of the preliminary study would be to identify the most cost effective and reliable means for enhancing forage vegetation for pronghorn. Once the best techniques or combination of techniques have been determined, they would be employed at locations within the BMGR to be determined by the CWG [Recovery Team].

Revised Biological Opinion for the Sonoran Pronghorn, 6/12/97, p. 43

Defenders realizes that it is imperative to take action to promote species recovery before the species declines to such a small size that recovery is not possible. However, we support a slower, more conservative approach to this particular project because of the significant uncertainties associated with its implementation. Defenders is not suggesting that the agencies do nothing to promote pronghorn recovery. Rather, the agencies should concentrate on those recovery strategies that each can implement immediately (i.e., changes in land use practices) while the forage plot proposal is subject to testing and further evaluation.

The DEA does not provide sufficient detail about many aspects of the proposed action to permit informed and substantive public comment. While the DEA reports that plot preparation may take 3-4 days and is likely to involve camping near the site, the DEA does not specify how many people and what type of equipment will be required to construct each site. Given the fragility of the desert ecosystem and the sensitivity of the pronghorn to ground-based disturbance, in particular, the number of people and equipment needed at each site will indisputably affect the environmental impacts associated with plot construction.

12 Similarly, though the proposed project includes a number of different activities associated with each plot location (i.e., plot construction, vegetation sampling, rainfall gauge monitoring, water deliveries, equipment repair, pronghorn observation, and predator/predation monitoring), the DEA contains no analysis of the amount of human activity at each forage plot on a daily, weekly, or monthly basis. Considering that existing uses of the range (i.e., military use, research activities, recreational access) may be excessive and adverse to the pronghorn, substantially increasing the activity level would appear to be antithetical to pronghorn recovery.

The description of the forage plots and their specific treatments also require more detail. The DEA, for example, reports that "some enhancement of forage conditions will be required during years of low rainfall," DEA at 5, yet there is no information about what constitutes low rainfall. It is unclear if a "low rainfall" determination will be based on the amount of winter rains, summer rains, or a combination of the two. Since the long-term environmental impacts of the project are dependent on the frequency with which forage plots are active, defining "low rainfall" and comparing that amount to historical rainfall data to determine how frequently forage

12 | plots may be used is essential if the public is to understand the potential overall environmental impacts of the project

13 | Similarly, while the agencies contend that the forage plot project will be terminated if the plots do not produce sufficient forage or if the pronghorn do not use the plots, the agencies should provide measurable criteria to make these determinations. Such criteria must be established and reported to the public so that there is some concrete basis for determining the future use of forage plots if the agencies elect, despite the evidence in this letter, to implement the project.

14 | The proposed project also involves the burning of creosote to create a more open habitat condition on forage plots to benefit predator detection by pronghorn. The DEA fails to disclose the existing density of creosote on each plot and what amount of creosote will be destroyed within each area. Creosote represents potential habitat for a number of desert species and, thus, its destruction will result in environmental impacts which are not disclosed or discussed in the DEA.

15 | Finally, the DEA proposes to seed forage plots to stimulate the production of a variety of desert annuals and perennials. While the agencies intend to use a seed source as free of weeds as possible, the DEA provides no evidence that the species represented in the seed mix actually grow on the forage plots. While all of the species in the seed mix may be found in the Sonoran desert, certain species may not grow in certain places due to a number of factors. Introducing these species into a previously unoccupied area could result in a change in the floral assemblage and desert ecology on and beyond the forage plots.

Given the controversy and significant impacts associated with the proposed project, it is particularly important that the agencies provide such detail to the public. To do so, Defenders recommends that the agencies construct and operate a test plot outside of pronghorn habitat. This plot, which should incorporate all of the activities proposed in the preferred alternative (i.e., drip irrigation, creosote burning, water deliveries, vegetation sampling, howling surveys, etc.), will reveal many of the details associated with plot development, including whether the plots will produce abundant forage, which can be ascertained and used in subsequent environmental analysis.

3. The DEA must evaluate a range of reasonable alternatives.

16 | The National Environmental Policy Act (NEPA) requires agencies to "identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 40 C.F.R. §1500.2(c).

The three alternatives offered in the DEA fail to encompass a reasonable range of alternatives. As written, the DEA offers two alternatives which call for the construction of 14 forage plots with different watering regimes and a no-action alternative. There are many other reasonable alternatives, as identified below, which should be considered by the agencies.

16 A | A Creosote burning.

The burning of creosote is part and parcel of Alternatives A (preferred alternative) and B in the DEA. Instead of combining this strategy with forage enhancement and artificial water development, the agencies should consider an alternative which emphasizes creosote burning alone as a recovery strategy. Creosote usurps a substantial amount of water preventing its use by other desert plants. In addition, creosote, depending on its density, creates a less-open habitat which may facilitate predation of pronghorn. By destroying creosote, the agencies intend to create open habitat to potentially reduce the risk of predation on pronghorn and to free up rainfall and groundwater for use by other desert plants.

Creosote burning alone, therefore, provides the potential benefits of increased protection from predators and enhanced forage production while avoiding or minimizing certain potential adverse impacts (i.e., disturbance, disease transmission, economic costs, and personnel needs) associated with the preferred alternative. This alternative is not without potential impact. Not only will there remain a risk of predation, including a potential increase in risk if forage production changes small mammal density and distribution, but the destruction of creosote will remove potential forage and/or habitat for certain species. By avoiding the need for well drilling, water delivery, vegetation sampling, predation surveys, and other activities inherent to the proposed project, this option is simpler, less expensive, and less disturbing to both the pronghorn and the desert environment compared to the preferred alternative.

16 B | B Forage Plots Without Free-standing Water.

The agencies considered but rejected this alternative claiming that free water assists pronghorn in digesting high-protein forage. DEA at 9. No citation or other support is provided to substantiate this claim. While pronghorn in less arid habitats may have a greater need for water, the adaptation of the Sonoran pronghorn to the Sonoran desert habitat suggests that free-standing water is not critical to the survival of the animals. Unless the agencies can provide accurate and compelling evidence that Sonoran pronghorn require free-standing water to survive, a forage-plot-only alternative should be subject to more serious consideration.

16 C | C Artificial Feed.

If forage is the limiting factor for pronghorn, the agencies should consider using supplemental artificial feed as one of the alternatives. Food pellets would have a different type of impact than watering that may prove to be less altering to the environment and less disturbing to the pronghorn. Many of the potential disadvantages associated with watering the desert could be avoided. Impacts like numerous, successive trips to water the ground, use of water, installation of a semi-permanent structure - drip irrigation tubes, and the possible growth of invasive species would be eliminated. An artificial feed alternative at a minimum, should consider the impacts of the possibility of domestication of pronghorn and the impacts of artificial feed on associated wildlife.

16 D | D Land Use Management

As previously stated, there are a number of existing threats to the survival and viability of the pronghorn which can be reduced and/or mitigated if the agencies would alter existing land use practices. Unfortunately, no agency has substantively altered its land use practices to enhance pronghorn recovery efforts. This alternative would describe and assess the impacts of all of the potential land use changes which can be implemented by the agencies immediately to facilitate pronghorn recovery.

16 E | E Traditional Methods:

Instead of implementing an action that will require, depending on the particular plot, discing, drip irrigation installation, water delivery, artificial water facility construction, creosote burning, and other activities, this alternative would use only traditional Tohono-O'odham farming techniques on a smaller number of plots in appropriate areas to enhance forage production. While this technique involves the manipulation of the environment, the manipulation is accomplished in a less intrusive manner and the short and long-term disturbances associated with this alternative are much less than the preferred alternative. This method is particularly appropriate in bajada and wash habitats where diversions can be created to slow or stop water movement thereby increasing forage abundance. Considering that pronghorn tend to use bajada and foothill habitats more frequently in the summer, when climatic conditions are most harsh, the modification of such habitats using traditional techniques would provide additional forage when it would be potentially most beneficial to the pronghorn.

16 F | F. Cholla planting

In the past, the agencies have suggested that chain fruit cholla was a critical food for the pronghorn both for forage and for water (See, Final Revised Sonoran Pronghorn Recovery Plan at 19). It has been postulated that the lack of fawn access to the fruits of the mature cholla have adversely impacted their survival and recruitment. Despite the apparent importance of cholla to the pronghorn, the agencies have failed to include an alternative in the DEA which proposes the seeding of cholla in areas appropriate for such plants.

This suggested long-term alternative calls for cholla planting instead of the proposed forage and water enhancement efforts. By eventually enhancing cholla abundance on the range, more succulent cholla fruits would be available to pronghorn adults and fawns potentially stimulating increased fawn survival and recruitment. This alternative would be preferable to the proposed action because it is simpler, less costly, and involves far less disturbance to the pronghorn and the desert environment and should be considered an additional alternative.

4. The DEA should be supplemented to properly evaluate the environmental impacts of the proposed project.

The environmental impact analysis section of any environmental document is intended to provide the public with an accurate evaluation of the environmental consequences of the

preferred action and any alternatives. The information used is supposed to be of high quality, the analysis is supposed to be accurate. In this case, the agencies have failed to evaluate many of the environmental consequences associated with the proposed project. A summary of many of the issues which were not evaluated or not properly evaluated is provided below.

17 | A Predation.

The DEA suggests that the forage plots/water developments are not likely to impact predator/prey dynamics or the risk of pronghorn predation because predators found in the Sonoran desert are not believed to be dependent on water. This claim, however, is not supported by the scientific literature. As reported by Rosenstock et al., (1999), there is evidence that water developments attract mammalian predators. The observation of predators and their sign were greater at water developments compared to unwatered control sites (Schmidt and DeStefano, 1996). More specifically, Cutler (1996) observed 6 predator species, including coyotes, bobcats, and mountain lions at water developments in Arizona. The DEA fails to disclose or discuss this evidence.

Even if predators were not dependent on water, this does not eliminate the potential impact of the proposed forage and water developments on pronghorn and other animals. If the forage plots result in an abundance of forage, the density and distribution of small and large mammals may increase. As predators rely on mammals for a major portion of their diet, an increase in small and/or large mammal density on and around forage enhancement plots will indisputably impact predator activities. The DEA, however, limits its analysis of predator impacts to water developments and fails to even consider how forage enhancement plots, if successful, may alter predator/prey dynamics. If, as is expected, predator numbers will increase near forage enhancement plots in order to take advantage of an increase in the density of small mammals, large mammals, including the pronghorn, will be at an increased risk of predation.

Furthermore, the agencies propose to destroy creosote to create more open habitat to provide pronghorn with an increased opportunity to detect predators while using the plots. This strategy may reduce predation risk on a portion of the experimental plots, but if predator density increases as a result of forage enhancement impacts on mammal densities, the predation risk for pronghorn entering and exiting the plots -- since these areas will not be manipulated -- will be higher than if no manipulation occurred. Moreover, since creosote will only be thinned near roads to preserve the visual characteristics of the area and since the area near the road is the only area that will be regularly watered, the risk of predation where the forage is to be enhanced will be higher than if no manipulation occurs.

18 | B. Disease

For decades, the Arizona Game and Fish Department and federal agencies have actively promoted the construction of artificial water developments in and landscapes to allegedly benefit wildlife. These developments have been based on the assumption that water is limiting in arid landscapes, and that by providing water, wildlife will benefit. More recently, this assumption has come under increased scrutiny (Broyles 1995, Attachment 1, Brown 1998, Broyles 1998).

Furthermore, current evidence suggests that artificial water developments are not beneficial to all species (Rosenstock et al., 1999, Broyles 1995) and that ecological effects of water developments are poorly understood (Rosenstock et al., 1999)

The scientific literature does not provide compelling evidence to suggest that the Sonoran pronghorn requires free-standing water to survive. While other pronghorn populations may have a demonstrable need for free-standing water, they have not evolved in a landscape as harsh as the Sonoran pronghorn. The mere fact that Sonoran pronghorn have been observed drinking from bomb craters or from natural or artificial water developments does not constitute proof that pronghorn require water for survival. More than likely, the Sonoran pronghorn is opportunistic in its use of free-standing water -- using the water if available but not requiring the water for survival. Considering that more than 129 natural and artificial water sources exist within the western portion of the Goldwater Range and the Cabeza Prieta National Wildlife Refuge, many of which occur in pronghorn habitat, if free-standing water were crucial for pronghorn survival then one would expect that the population should be larger than its current size.

Indeed, as the scientific evidence indicates, the proliferation of artificial water developments may be doing more harm than good to the Sonoran pronghorn as a result of increased predation, increased competition, and intra and inter-specific disease transmission.³

The role of artificial waters in disease transmission is both direct and indirect. Direct threats include animal consumption of contaminated or otherwise harmful water which can result in disease and death. While the loss of one or even several animals from a stable, secure population may not be of biological significance as suggested by Rosenstock et al. (1999), the loss of any animal from a small population is of greater concern. Thus, if artificial waters are to be used by pronghorn, then the agencies must implement measures or practices to routinely check the quality of the water and to clean and disinfect those facilities which are determined to contain contaminated water.⁴

Indirectly, artificial waters provide habitat for arthropod vectors which facilitate disease transmission between and among species. According to blood test results from blood samples drawn from captured pronghorn, these animals have been exposed to leptospirosis, bluetongue virus, and epizootic hemorrhagic disease (See, Attachments 2-6). While it is unclear whether these diseases have adversely impacted the Sonoran pronghorn population, the evidence suggests that adverse impacts are possible. For example, there is evidence in the literature that both

³ In addition, according to many agency officials, illegal aliens are aware of, and use, the artificial water holes to cross the desert. Such use may disturb and displace pronghorn who may be in the vicinity. This should be considered in evaluating the forage plot project.

⁴ The agencies' claim that more artificial water developments will broaden the distribution of animals reducing the potential for disease transmission is wishful thinking. More than likely, an increase in water developments will increase the spread of disease throughout the affected area.

bluetongue virus and epizootic hemorrhagic disease can cause mortality in pronghorn. According to James DeVos of the Arizona Game and Fish Department, the high prevalence of seropositive pronghorn coupled with low nutritional status could have contributed to pronghorn mortalities (See, August 4, 1998 letter from DeVos to Donald Tiller; Attachment 2). Furthermore, epizootic hemorrhagic disease may be causing reproductive problems, including reduced productivity, in pronghorn even if there is no overt mortality (See, January 5, 1999 letter from Dr. Lynn Creekmore to Laura Thompson-Olais; Attachment 3). Hoff and Trainer report that bluetongue virus and epizootic hemorrhagic disease have resulted in significant epizootics in pronghorn. In addition, according to Dr. Creekmore of the National Wildlife Health Center, leptospirosis could be having an effect on fawn survival by causing abortion or birth of infected, weak fawns.

All three diseases are transmitted by arthropod vectors generally inhabiting moist areas. Since the majority of the pronghorn have likely been exposed to one or more of the diseases, this suggests that suitable habitat exists for these arthropod vectors on the range and that pronghorn and potentially other desert ungulates utilize these habitats. Given the conditions needed by the arthropods to survive, existing artificial and natural water sources likely provide habitat for these arthropods. New water developments will create new environments where these arthropods may flourish increasing the risk of intra and inter-specific disease transmission to pronghorn. Furthermore, the forage plots, because of the moist conditions and since animals may concentrate at these sites, may also act as a reservoir for these arthropod vectors.

Considering exposure to these diseases appear to be widespread in the pronghorn population and that the impacts of these diseases on pronghorn are potentially adverse, exacerbating the severity of the disease threat by creating new habitats for those species who transmit these diseases is irresponsible and antithetical to pronghorn recovery.

20 | C Disturbance

While the impact of low-level jet overflights on the pronghorn may be uncertain, there should be no debate that ground based activities can result in substantial disturbance to pronghorn displacing them from important and preferred habitats and increasing their energy expenditures. These impacts, in turn, can lead to reduced productivity, increased susceptibility to disease (due to nutrition deficiencies), and death.

In this case, the agencies concede that the construction of the forage/water plots and the regular delivery of water to these plots will result in a temporary disturbance to pronghorn.⁵ Despite this admission, the agencies have completely failed to consider all of the likely

⁵ Even if the agencies should elect to implement the proposed project, construction of forage enhancement plots should be delayed until, at a minimum, fall. Constructing forage enhancement plots during the spring will result in disturbance impacts during the pronghorn birthing season.

disturbance factors associated with the proposed project and how that level of disturbance will impact the pronghorn over the short and long-term

As proposed, the project involves a substantial amount of human presence on and around each forage plot. In addition to delivering water, there will be routine inspections of the drip irrigation system, rainfall gauge monitoring, fecal pellet collection, vegetation sampling, systematic searches for pronghorn carcasses, predator howling surveys, and aerial and ground based pronghorn observation. Indeed, the proposed project will substantially elevate the level of human activity and, thus, the amount of disturbance within pronghorn habitat to the detriment of pronghorn in the vicinity of this activity. As a result, the forage plots which are intended to attract and benefit pronghorn may not be subject to the expected level of use by the pronghorn

If these disturbance factors persist indefinitely, the continual displacement of pronghorn from important habitat and the increased energy loss causing by a repeated flight response to ground-based disturbance may result in decreased production and increased mortality. Even the current level of disturbance may be responsible, in part, for the low recruitment rate demonstrated over the past several years.

2.1 | D. Pronghorn Distribution:

The DEA calls for the placement of forage enhancement plots in areas used by pronghorn. If such plots are used by the pronghorn this could alter the distribution, movement, and habitat use patterns of pronghorn and other ungulates. The DEA, however, fails to address both of these potential impacts

Military agencies are hoping that forage plots will effectively curtail pronghorn use of the tactical ranges where their presence prevents certain military exercises. Some have claimed that the natural migratory or wandering behavior of the pronghorn will overcome any attraction caused by the forage enhancement plots, lessening the possibility of shortstopping the pronghorn. Whether this is true cannot be determined based on the available evidence. If forage plots provide an abundance of food and if bedding/resting habitat is close by, pronghorn may choose to maximize their use of these areas since all of their biological needs may be satisfied.

If forage enhancement plots alter distribution, movement, and habitat use patterns of the pronghorn and other ungulates, the consequences could be significant. Not only could the overall range of the animals decrease but an increase in ungulate density on and around forage enhancement plots could impact predator/prey dynamics, increase the potential for inter and intra-specific disease transmission, and increase intra and inter-specific competition.⁶

⁶Furthermore, by altering ungulate distribution, this may result in increased human activities, including hunting, in those areas open to human use. This may result in increased disturbance and stress to the animals, including the pronghorn, potentially resulting in displacement.

In this case, both the proposed water developments and forage plots may attract other ungulates to or near the experimental plots increasing competition between pronghorn and other species for forage and possibly water. If pronghorn are not aggressive competitors, they may receive the alleged benefits from the experimental plots intended by the agencies

2.2 | E. Precedent:

There is no precedent for the proposed action. While supplemental feeding of game animals is a common practice in some states, the purposeful development of forage plots and artificial water sources to aid in the recovery of a listed species has not ever been attempted. As a consequence, this project, particularly if successful, will set a dangerous precedent of using habitat manipulation practices to create artificial habitats to aid in the recovery of listed species. Thus, instead of relying on the establishment of critical habitat, preparation of conservation agreements, or similar strategies to protect and preserve the habitat of a listed species, recovery will be achieved without such potentially controversial decisions by engaging in habitat manipulation to maximize the number of individuals from a listed species who can exist on the smallest piece of habitat possible

The precedent, good or bad, which may be established if the proposed project is implemented and successful must be evaluated in an environmental document. It is imperative that the public understand the potential precedent of this project and if or how it may impact other recovery efforts in order to prepare substantive and informed comment on the proposal

2.3 | F. Desert ecology

Although the proposed project calls for the intensive manipulation of the desert to create habitat which the agencies believe will result in an increase in pronghorn fawn recruitment, there is virtually no discussion of how the proposed project will impact desert ecology. This impact is unavoidable since the very intent of the project is to create floral oases in the midst of a harsh desert landscape. Despite this obvious impact, the DEA contains no analysis of how the proposed project may alter the ecology of the experimental sites and surrounding lands, including the potential changes in faunal and floral composition, nor does the DEA discuss the environmental impacts of burning creosote to other species who may use creosote as habitat. To address these concerns the agencies should, at a minimum, subject the DEA to analysis by at least two independent desert ecologists.

2.4 | G. Soils

Desert soils are incredibly fragile. The cryptobiotic crust which protects desert soil is easily damaged by human activities leading to increased potential for wind and water erosion. Thus, in turn, can result in the loss of top soil ultimately eliminating vegetation. The destruction of vegetation serves only to exacerbate these impacts since the root systems of plants stabilize the soil. The proposed project involves a number of activities, including creosote removal, discing, water facility construction, and human activities, which will disturb the soil's crust,

potentially causing adverse ecological impacts. The DEA should evaluate the potential impact of the proposed project on the desert soils on and in the vicinity of the experimental forage plots.

25 | H Cumulative impacts:

The cumulative impact analysis in the DEA should be expanded. The agencies have elected to simply list some of the activities which occur on the range but failed to subject the litany of agency activities to cumulative impact analysis. A cumulative impact, as defined by NEPA, is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. §1508.7. Providing a sufficient cumulative impact analysis is critical to aiding the public and decision-makers in understanding the full range of impacts associated with the proposed project.

A proper analysis of the cumulative impacts of the proposed action would consider the impacts of the action in relationship to other past, present, and foreseeable future activities on the range which may impact the pronghorn. The agencies should evaluate the impact of forage plots on pronghorn mortality in relation to other range activities that influence pronghorn mortality. Similarly, the potential disturbance associated with the proposed project should have been analyzed in light of existing disturbance factors associated with agency or public use of the range.

24 | In regard to future activities, the agencies have to consider, at a minimum, the potential development of additional forage plots and the need to radiocollar additional pronghorn in their cumulative impact analysis. Considering the agencies' interest in establishing additional pronghorn populations, should they proceed with the proposed project and if it is successful, it is anticipated that the agencies may propose the development of additional forage plots to expedite pronghorn recovery. If the agencies believe that this may occur, the impact of such an action must be considered in the cumulative impact analysis. In addition, considering the agencies' intent to monitor pronghorn activities in relation to the proposed forage plots, it is anticipated that additional pronghorn may need to be collared to aid in this effort. If this is the case, the agencies must also consider the impacts of this activity in the context of a cumulative impact analysis.⁷

Conclusion

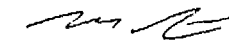
While few question the need to increase the number of Sonoran pronghorn to preserve this endangered subspecies, the agencies appear to believe that the intentional manipulation of the desert environment to create forage enhancement plots and artificial water facilities for pronghorn is the only and last strategy available to achieve recovery. However, the agencies

⁷If the agencies determine that additional forage plots are necessary or that additional pronghorn need to be radiocollared, these activities would also have to be subject to independent analysis in a legally sufficient NEPA document.

have ignored or refused to consider other available options because they require hard decisions with unavoidable impacts on current land use practices. Forage enhancement, on the other hand, is far more palatable to the agencies because it suggests that recovery is underway even though that recovery is artificial, may not work, and its effects on the pronghorn are unknown. In addition to moving forward with the forage enhancement, Defenders urges the agencies to revisit their own management decisions to identify and implement land use management changes which can be made immediately to aid pronghorn recovery. Defenders views forage enhancement as only a short-term measure to improve fawn recruitment, but ultimately, for long-term recovery of the pronghorn, the agencies will have to make difficult land- management decisions.

Defenders is committed to the recovery of federally listed threatened and endangered species using responsible, ecologically appropriate, and scientifically defensible recovery strategies. While Defenders believes that the proposed project has many areas that need further explanation, it supports the implementation of a more cautious and methodical strategy as described above. Thank you for the opportunity to submit these comments on this important management issue.

Sincerely,

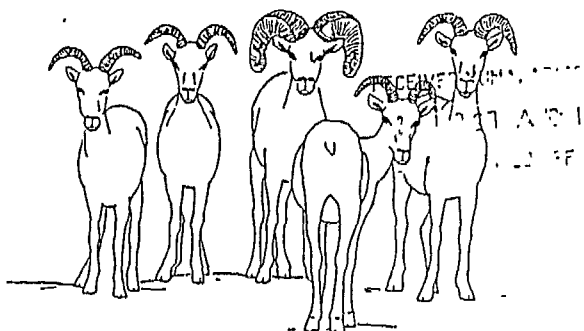


Mike Senatore
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cc John Hervert, Pronghorn Biologist, AGFD
Mike Coffeen, Consultation Biologist, USFWS
John Morgart, Pronghorn Recovery Team Leader, CPNWR



③

Friends of Cabeza Prieta

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22 March 2000

Dear Ms Gail Acheson, Susanna Henry, John Hervert, and Other Researchers.

Thank you for the opportunity to comment on your Sonoran Pronghorn Food Plot plan. These comments are made on behalf of and with the help of the members of Friends of Cabeza Prieta. Please keep us on your mailing list and allow us to comment of further drafts, projects, and plans. These comments are made in the spirit of helping Sonoran pronghorn within their total environment.

Before you build a fleet of airplanes, it's best to fly one first and see if it works. Similarly, we think it best to farm for Sonoran pronghorn starting with a 2 acre plot instead of 2500 acres.

Everyone is concerned about Sonoran pronghorn. They're wonderful creatures, real spirits of the desert. We wish them well.

But farming for pronghorn?

1. Of six plantsmen and botanists we spoke with, all are quite skeptical that this farming plan will work. It's every farmer's dream: plow ground, throw out seeds, water now and then, and wait for the harvest. But if farming were that easy, we'd all be sitting on a tractor. Desert gardeners everywhere will be delighted if this works---few of us can even get small plots of desert seeds to flourish, let alone acres of them in concert.

2. We can't find any record of such large plots working. Where have such plant plots worked? Desert plants--both annuals and perennials--have exacting but vaguely understood requirements for amount and timing of water, for soil temperature and sunshine, for little understood soil chemistry and seed genetics. These are not African daisies. Maybe some of the Valley seedsmen and commercial growers can shed some light on the feasibility of field growing native plants.

Desert plants can be very frustrating to grow, even when bought in nursery containers. The experts tell me that spring blooming annuals must sprout in the fall and are triggered by a heavy rain between September and December. The needs vary with each species. The triggering rain must be at least one inch and must coincide with a warm germination temperature. Then regular rains must fall every month until the plants finish blooming. Good years occur only once a decade on average. Frosts and the nutrition in the soil from last year's crop are strong factors, too. For more information, see Mark Dimmitt's chapter in *A Natural History of the Sonoran Desert* (especially page 150) published 1999 by Arizona Sonoran Desert Museum and UC Berkeley.

3. Botanist Richard Felger, who has 35 years of field experience in the Sonoran Desert, predicts that this project will cause irreparable harm to an extensive region of fairly pristine desert. He tells us that this project opens an enormous door for non-native invasive species, many of which out-compete natives. He contends that these desert feedlots have little botanical chance of success, especially if the native seeds to be used are not a compatible local genotype.

We too have questions.

4. A. What plant species are you promoting? Of the seeds in situ, which ones do you hope your watering affects? What percentage of the pronghorn's diet do these species comprise?

6. B. You propose to use a seed drill for planting. To what depth will it be set? Conspecific seeds usually are planted to an optimal depth, do you plan to plant all species at the same depth? If so, how will that affect viability? Or, if hand-seeded, will the seeds be raked with soil cover? I know of no place farmers just throw out seed and reap a significant harvest. Nature does it by broadcasting hundreds of seeds for every one which sprouts.

7. C. The EA states that this project is trying to enhance and prolong winter annuals and spring-greened perennials. Spring annuals sprout and begin growing in the fall, will you begin watering them then? Spring annuals generally succumb to the heat of late April and May, are you sure you can prolong them with supplementary watering into June and July? What plants do pronghorn lawns traditionally rely on during the dry/hot time between weaning and the summer monsoons?

8. D. Some of the plants on your seed list are spring annuals, some are summer annuals, some are perennial, and some don't even grow here. Will you water these plots year-round? For example, on the Tevis (1958) study, how long did the effect of a 2-inch watering last in a desert environment?

9. E. Desert seeds are famous for lingering in the soil for years and then sprouting under the right conditions. Granivorous rodents and birds are commonly found in areas where seed production has been low or non-existent for several years, because so many seeds remain in the ground from bountiful years. Have you test watered any plots or similar areas to see what may come up without seeding?

F. The EA says that where natural germination has not been sufficient, the area will be disked and seeded with native seeds. What is the seedling or growth threshold for that decision? When

It seems that that plot would then have to start all over

G Maybe this would be clearer and more convincing if you sketched an optimal scenario, what plant regime and timing are you shooting for? What natural condition favorable to pronghorn are you aiming at? What would a fawn really like best?

10 | In short, this EA could use some farmer or gardener talk about seeds, soil, moisture, fertilizer, planting times, and planting techniques. It would also greatly benefit from a little test garden out back of the office where the techniques you propose can be tried on a small scale and where it poses no threat. Cheap, quick, easy, no EA needed

11 | 2. According to your proposal, the experts haven't isolated the reasons why some places seem to be preferred feeding grounds for these pronghorn. Is it because the soil is churned up, so pioneer species take hold or rain better permeates? Because there is extra plant nutrition--nitrogen or phosphorous from munitions--in the soil? Because there is more rain there? Because there is some soil substrate condition that causes water to puddle in shallow bomb craters? These factors seem to lack analysis--as an EA should do--but the proposal presumes to address all of these possibilities in a shotgun solution because the real causes are not identified or rated

If churning is the answer, then a sheepsfoot roller may be indicated as the key management. If it is nutrition, then fertilizer is the answer. If it is a clay bottom, then other craters could be clay-lined. If water is the real key, then provide some temporary tanks, and forget about all the farming.

In short, the model and the type-area need further peer-reviewed study itself before being widely applied elsewhere on the Range.

3. The project analysis lacks an accounting of costs, a schedule for the timing and amount of water, the expected crop yields, a look at fertilizers, and an eye to the critters--the birds and bunnies--that eat seeds and seedlings. What will come up? Invasive species such as Sahara mustard are real threats in this region. Seldom does the desert produce back-to-back bumper crops of annuals. We see no citations or evidence food-plot proponents have talked with the commercial growers of native plants or even to a student in Agriculture 101.

12 | A What money has been budgeted? What will be required? Who will fund this project?

13 | B What is the watering schedule? If not a time table, then how and who will monitor and report soil moisture and plant-growth condition? Will the water trucks be on call or what will be the lag time until they can deliver? How many water trucks will be needed and where will they come from?

14 | C What is the price and availability of native seeds? What is the viability of native seeds harvested from other regions? Have you found or done any viability studies here?

15 | D What is the expected crop yield by species and productivity (growth rate)?

16 | E Will fertilizer be used? If so, what and how much? Has the soil chemistry at each plot been monitored?

17 | F What hours and staff have been budgeted? What will be their costs?

We fear that the project will begin but, because of insufficient funding or inadequate design, the project will collapse and abandon any pronghorn which have been learned to find water or food where you have left it for them.

4. This proposal does not review or suggest a sufficiently wide range of options

18 | A A test plot is needed. Better yet, start tomorrow on 1 acre of private land. No permits or public discussion would be required. Take a fallow acre near a well and see what grows. The biggest hypothesis of the plan is the first one asking whether there will be a difference in forage production on treated and untreated plots. And it's unclear if the plan is trying to raise new plants (such as lupine and penstemon) or to water existing plants (such as Krameria).

B If that works, then try it out on Sonoran pronghorn.

19 | C In the pronghorn discussions, it is suggested that chain-fruit cholla is a key food and fluid source. Should these be planted, though that raises further questions? (Incidentally, the stock photo of the cholla-ensnared fawn delivers the wrong message. It represents that cholla are a threat to pronghorn, when really pronghorn rely on cholla fruit for food and water, according to John Hervert's field work.)

20 | D What happened to the thought about doing an old-style of Native American farming?

21 | E Your proposal claims that the plots will only provide supplemental forage during the driest part of the year. Why wouldn't you want to keep them viable all year? Don't pronghorn need quality forage throughout the year? If you're going to this extreme, shouldn't it benefit pronghorn year-round until they are recovered?

22 | F The options should be more incremental: a few plots over time, with fuller study as we go.

23 | G The options should include shutting down the entire Range to military ground or air-to-ground activity. Another option should be to move the TAC Ranges out of pronghorn habitat. The Air Force refuses to consider these, and frankly there are indications that some people in the Air Force wish these pronghorn would go away--find them another home, capture, breed them so this population is no longer needed, study them unto death, or simply let them fail.

24 | H One option not considered is supplemental feeding with a lunch wagon. Roll out the water goat and a hay wagon. Did you consider supplemental feeding stations carrying zoo food, such

as 3 pounds of alfalfa hay and 1 pound of herbivore pellets per animal per day? Or mobile water dispensers, such as farmers use?

5. Before anything is done, we recommend a clearer and fuller presentation of the study design

25 | A. What is the goal? How do we know when we've reached home plate? For example, if the goal is to reach a set level of recruitment? Or of survivability to yearlings? Or to pull pronghorn out of the TAC ranges?

26 | B. What is your statistical design to evaluate the results of this "experiment"? What will the criteria be to determine if the project is successful or not?

C. What preset triggers will you use to call off the project if it harms pronghorn?

26 | D. What methods will you use to determine the effects of this project on other ecosystem components such as small mammals, rabbits, and birds? What criteria will you use?

25 | E. What ARE the expected results?

27 | F. If it is judged that predators become a problem at the food distribution sites or the food plots, we request that they be moved by non-lethal means. This is such a big-budget project that price should be no object; it is such a high-profile project that the military and agencies do not need the distractive national furor over predator control.

25 | G. What methods are you planning to use to determine if the vegetation is responding to the watering?

28 | H. What are the effects of the research itself? Can you study these pronghorn without disturbing them?

For example, we are a bit confused why you assume that water delivery at night won't disturb any pronghorn? Is there evidence they won't bed near food plots or that they wouldn't be disturbed by lights, motors, and voices?

And we wonder what commotion drilling wells might cause. After all, we assume you do not want to drive them out of the very areas they prefer to use.

Or what effect the aggressive removal of buffelgrass from food plots might have on pronghorn using that area.

25 | I. Who will perform the monitoring of these plots? What will be the frequency of the monitoring? How many people will this be? Has the potential harassment to the pronghorn due to monitoring been evaluated through the Section 7 process?

28 | J. What will you do if there are pronghorn on the plot when it's time to monitor or bring in more water?

29 | K. We fail to see what problem creosote causes. Does it block pronghorns' line of sight? Does it use too much soil moisture? We contend that whatever its perceived demerits, they are not as severe as blading the ground which will definitely expel soil moisture and to invite invasive species, such as Sahara mustard which prefer disturbed soil. The creosote we see in spring have higher density of annual plants surrounding their bases than in the open spaces of ground. Dimmitt (above page 263) calls creosote "an important nurse plant" and an important shelter for rodents, reptiles, and invertebrates. How does that reconcile with your urge to eliminate creosote?

30 | L. Some of the figures don't seem to add up. For example, on page 6 "The area covered by the water truck with water would cover an area of approximately 5 000 square meters in size (1367 square feet) per plot." Did we miss something or is this a mis-conversion from square meters to square feet?

31 | M. When the water is sprayed onto the surface, what will be its spray rate and vector? In some places, the ground would be bare dirt and subject to erosion. Most farmers take great pains to diminish the impact from moving water, either by making fields nearly level or by assuring that spray comes down vertically and not obliquely. How will this be done by a water truck so that the seeds are not redistributed or uncovered?

29 | N. In the EA we find no analysis of flame-thrower chemistry or byproducts.

31 | O. How will water from the trucks be distributed? Which nozzle? What pace? How will soil moisture be monitored? Again, we think that one test plot is needed to answer these sorts of questions before launching the full campaign.

32 | P. Lacking in this is a sufficient data set of pronghorn populations and a full description and analysis of what has changed in pronghorn habitat. For example, one of the underlying assumptions being argued in the EA is that herds and bands of Sonoran pronghorn formerly migrated to the Gila or Sonovta rivers for water and seasonal forage.

Another assumption we hear is that the Range a century ago was a grassland. Again, where is the evidence? Where are the climatic data showing changes? In discussions with climatologists and game managers, we hear that there were two other "droughts" in the 20th century far more severe than this current dry spell. How did Sonoran pronghorn make it through those times? What has changed in their habitat now inside the Range?

33 | Q. How does this proposal fit into other activities in the habitat? For example, what will be the effect of paving roads on the Range? An EIS is called for to study and evaluate the fuller picture. This food plot experiment is but one knot hole in the fence--what is the overall picture and strategy for survival and recovery?

28 | R. And we need some measurement, some Richter Scale, for human disturbance of these animals.

6. Administrative questions:

- 34 | A. We have heard that a Section 7 has not been done and that the Native American nations have not been consulted both may be legal requirements What do you say?
- 35 | B. Why is this EA being written by the BLM and the project run by Arizona Game and Fish? Shouldn't the Air Force be the lead agency since the majority of the funding is of Air Force origin? How does Fish and Wildlife Service the lead endangered species agency, fit in? Who will foot the bill?
- 36 | C. More troubling, we hear rumors that this deal was done prior to the start of public comment let alone the conclusion We have heard a rumor that the military decided within a week of the last Partners Meeting to go ahead with this project regardless, and with a "let'em sue if they don't like it" attitude Is that true?

Conclusion: The lasting image we have of this proposal is this spectre a soldier in battle gear brandishing a flame-thrower to wage war on the desert This spectre typifies a perceived military attitude that if nature doesn't cooperate just kill it, Nuke it til it glows Unfortunately, after listening to military statements that "in Mexico they eat these pronghorn " we are unsure that the military wouldn't just as soon braise the pronghorn too We hope and doubt that the military, or any agency, wants such an image

We urge you to suspend this project until:

-
1. You can show an acre where you've successfully farmed native plants and can show the replicable protocol that made it happen
 2. You can document and explain the reasons and factors why some Sonoran pronghorn seem to prefer areas where they are vulnerable to Air Force ordinance
 3. You fully analyze costs and establish long-term budget commitments
 4. You look at the widest range of options some of which are far cheaper and easier and incremental than your options A or B
 5. You walk through your study design in detail As one observer was heard to say, "This design isn't ready for a senior's honor project let alone work with an endangered species " More data and more citations would help
 6. You iron out administrative concerns and questions.

7. You launch an EIS to assess and plan for all the cumulative effects and factors affecting Sonoran pronghorn What other projects can be and are being done to help pronghorn?

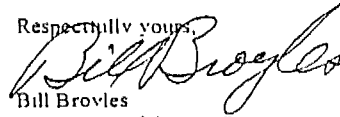
We urge you to conduct research at one (1) test plot to iron out the variables in this project It has the potential to harm pronghorn if done incorrectly, and that risk is not worth your unplanned haste The first rule of emergency medicine is "Don't make it worse "

We have too many unanswered questions to support this endeavor now We suggest you redraw this proposal in the light of fuller review We appreciate the opportunity to comment on this version, and we request the opportunity to review the next draft

To zoom the telescope for a moment we need not just a view of this particular project but we need a full picture of all cumulative activities This EA needs to be put into the context of an EIS and the overall pronghorn recovery plan The EIS will need to look at all factors affecting these pronghorn

From personal conversations we know that most folks working on this project are sincere and knowledgeable, and have the pronghorn's best interest at heart However from other comments in meetings and newspapers, we fear that some military and agency personnel may be going through the motions only in order to look effective. Claims such as that by a Goldwater range commander saying "We take the greatest interest in making sure we comply with the biological opinion" (Arizona Republic, February 22, 2000) fall far short of saying "We will do everything we can to help this magnificent animal survive and prosper "

None of us could sleep well knowing there is a hungry or thirsty pronghorn out there but we'd like to see tested solutions before the Air Force plows up and burns off 2500 acres of land If it does work on a small plot, then the rest of the experiential questions need to be answered to see if the pronghorn use the plants and if they benefit Let's pray they do And let's pray we find some real solutions to help them We'd hate to outlive them

Respectfully yours,

Bill Broyles
for Friends of Cabeza Prieta

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RECEIVED YUMA, AZ

FEB 23 1999

February 23, 2000

Ms. Gail Acheson
Yuma Field Office Manager
2555 E. Gila Ridge Rd.
Yuma, Az. 85365-2240

RE: Sonoran Pronghorn Habitat Forage Enhancement
BLM EA: AZ-050-99-045

Dear Ms. Acheson, we have reviewed the Environmental Assessment referenced above. Your staff has done an excellent job in developing what is fundamentally a difficult Environmental Assessment

We recommend this proposal does not proceed as it is currently proposed

We have several general comments and then follow with several specific ones.

GENERAL COMMENTS

Our primary concern is that the Proposed Action and "Alternative B" have the potential to negatively effect Sonoran pronghorn (SP). This unanticipated outcome would result if any or a combination of the following situations occurred.

1. That the initial and continuing disturbance activities associated with the Proposed Action may cause the SP to vacate these areas. We suggest that these currently used areas are important and possibly critical areas for them (see page 21, para. 2, of the Revised Sonoran Pronghorn Recovery Plan: USFWS 1998).
2. That the behavior of these animals becomes effected by the addition of the plots. Resulting in the SP not exploring and exploiting their entire home-range as they currently do but becoming increasingly sedentary and thus increasingly dependent on these plots.
3. That coyotes that typically (in open desert), occur in singles and pairs, are able to form packs around the forage plots due to increased densities of rodents, hares, and other prey, and that these packs became more successful opportunistic pronghorn predators, similar to the behavior observed when coyotes are preying on concentrations of domestic sheep.
4. The EA is inadequate in making the case for a project of this magnitude. The EA in fact indicates the current SP population is possibly 50% greater than was estimated in the mid 1980's.

Page 2 of 7

The EA intimates a sense of urgency for this proposed action, that the SP population is at special risk as indicated by recent fawn recruitment; which is then reported as low as none in 3 of the past 5 years. The reviewer should also be provided with the estimated recruitment for the other 2 of those 5 years

In order to make a strong case for the Proposed Action, the estimated age structure for the existing adult population should be given. This data could be extrapolated from the marked (known age) population and the recruitment estimates. If 50 to 75% of the adult population is > 7 to 8 years old, we do not agree extirpation of this population is eminent, which while not explicitly asserted in this EA, is getting to be commonly heard when discussing SP. We note from the SP Recovery Plan (USFWS 1998), that in 1995, 45 new individuals were recruited. It is expected that in this environment, on the margin of this species' ecological range, that recruitment has and will occur in "booms" and "busts". We should be preparing to take advantage of the next boom cycle.

The EA describes a population oscillating (as expected) around its dynamic carrying capacity. As we have been experiencing an on again off again drought, it can be reasonably anticipated that a wetter cycle is likely in the offing. This SP population appears to be doing as well as should be reasonably hoped for. We observe the population is persisting at a healthy level through yet another, fairly normal period of drought.

We must be cognizant of the potential presence of a rarely considered risk factor in resource management: that of "over-managing" a population into extirpation. The fact that 8 of 16 collared SP have been lost since 1996 troubles us, as the population has not seen a commensurate loss. To blame coyote predation for "most of these" (page 22, USFWS 1998) without explaining this discrepancy indicates to us that there needs to be greater scientific objectivity brought to the SP recovery effort. We recommend the Core Working Group evaluate the rate of mortalities associated with the Mexico captures in 1991 and 1996 to better determine if future capture efforts for purposes other than transplants are desirable.

In addition to our recommendations elsewhere herein, we recommend the recovery agencies spend more of their SP time as follows:

- Continuing close monitoring of this and Mexican SP populations
- Continuing close coordination with the military & other entities to minimize their negative effects on SP

• Preparing the planning and enabling documents & identifying receiving sites so that when we have a natural or management induced expansion of the SP population, we are positioned to take advantage of it and actually translocate one or more herds. Why areas such as King Valley in the KOFA NWR, OPCNM, YPG, and the Palomas Plain haven't incorporated SP recovery strategies into their own recent resource management plans, despite our earlier recommendations that they do so, remain a mystery to us.

7 The EA should provide the reviewer with the population estimate that has been identified that will then allow us to actually capture and translocate SP to their historic range. If this number has not been identified or is not reasonable (such as the 500 goal in the Revised Recovery Plan), the proposed action, purportedly to enable this transplant action (page 3, para. 7), becomes inane

8 The EA presents an inadequate range of alternatives. We recommend the addition of a fully developed alternative that provides 2 - 5 water developments as described later, in known SP use areas.

9 The EA ought to provide a cost estimate and the intended funding source(s) for this project so that a rudimentary cost/benefit ratio can be established.

We recommend should the Bureau decide to proceed with a project of this nature, it issue RFQ/RFP for technical but critical components of this project including the experimental design, floral enhancement, and water development elements.

SPECIFIC COMMENTS

Page 1, paragraph 5: The extirpation of the Sonoran pronghorn population in the San Felipe Desert of Baja California should be cited to demonstrate the fact that we have already had a fairly recent experience of losing a population of these fine animals.

10 Page 2, paragraph 5: The EA makes a good case (page 2, "large numbers" of fawns surviving until summer) for developing water for SP. Conversely, the EA does not make a strong argument in favor of developing tracts of forage. An assumption is required, that in dry years, does are producing fawns, but at 90 days of age they succumb to an inadequate diet. We note this, same diet must maintain their water balance. Our processing of this information leads us to reason that the available forage, particularly the perennials, are likely nutritionally adequate but lacking in sufficient moisture content for the fawns to digest it. If these 3 month old fawns had an opportunity to drink, it should reason that they would then be capable of processing their natural diet. This is what we observe with pronghorn elsewhere, and other desert ungulates. Therefore we challenge the rejection of the Free Water Alternative briefly addressed on page 9, para. 3

10 Therefore we recommend if this proposal is to be implemented, it be done sequentially with the water developments being provided first, coupled with an evaluation of the populations response, prior to implementing forage enhancement treatments. The EA appears to concur with us on this point, see Page 7, paragraph 4. This approach would also align this investigation with the research needs identified in the recent AGFD White Paper regarding wildlife water developments

11 Page 3, paragraph 3. We reject 14 sites as being excessive for an experiment of this apparently untested nature. We recommend therefore, an initial treatment (water developments only) of 2 to 5 sites with an appropriate period for evaluation, prior to expanding the action

12 Page 4 Hypothesis testing, We suggest these hypotheses are inappropriate for evaluating the effects of the Proposed Action or Alternative B. The addition of free water at each plot (commingling treatments) obfuscates the conclusions apt to be drawn from number 3 through 4 and possibly 6. Hypothesis development should be aligned with the expected affects of the treatment. Treatments ought to be tested individually whenever reasonable, as is possible in this situation

13 Page 5, paragraph 3. There isn't adequate justification for the acreage given. If on these acres, forage production was raised from a typical dry year of 100 lbs/acre to a modest 250 lbs/acre, this difference would be + 409,650 lbs, enough to feed 170 SP for a year if they ate nothing else. The proponents should provide their estimates and desired/expected SP population response from the Proposed Action.

14 Page 5, paragraph 4. The expected time period to complete the Proposed Action should be provided. Management flexibility regarding for example, response to our entering a wetter climatic cycle should be given

15 Page 5, paragraph 8. We disagree with the concept of implementing plots in areas SP are currently using. The plots if they are established, should be in known SP use areas, but not when SP are there by definition, current use infers current value to these animals and they should not be stressed or disturbed any more than absolutely necessary (ex. when they are in live fire areas) by our management activities

Page 6, paragraph 1: We completed some calculations and found that to water a plot this size with 5" (a reasonably minimal biologically significant precipitation event that will trigger germination) of water would require some 13875 gallons. A typical 1500 gallon tanker truck would have to make 9.25 trips to deliver this to one plot. As several of these plots are hours from the nearest water supply, we are stuck with the vision of a convoy of water trucks roaming about the desert, churning long linear clouds of dust into the air, while servicing these plots (see page 16 paragraph 4). This and other discussions in paragraph 5 regarding irrigation do not sound practical. We suggest the high salt content of locally available water coupled with shallow watering & high evaporation may result in unsuitable soil conditions

We have observed repeatedly that artificial watering does not produce equivalent germination and establishment to like quantities of natural precipitation. This is likely due to atmospheric and surrounding soil diffusion potentials, salinity, ambient humidity/temperature, etc. In order to simulate a wet winter, watering will need to be a 33 - 5" application, every other day, for 1 - 2 weeks duration

17 Page 6, paragraph 4: The Bladderpod listed *Isomeris*, is to our knowledge, endemic to the Salton sink area of the Colorado Desert. We suggest you consider *Lesquerella gordonii* also known as "Bladderpod" which is native to the area in question. We suggest the seed mix be given further analysis as such obvious choices as *Plantago*, *Astragalus*, and arguably *Erodium*, were overlooked

19 The inadequacies of the forage enhancement component of the Proposed Action suggest to us that you should actively seek additional review of this proposal by biologists and other disciplines and/or experience

19 If the natural forage is determined to be inadequate despite water being made available and actually utilized, a more realistic approach to increasing the SP nutritional intake would be to contract a local farmer to produce and harvest the desired forage and have the convoy of trucks deliver it, rather than rely on salty water mixed with hope.

We recommend if supplemental feeding is to be employed, to explore the concept of delivering a commercial feed to the desired areas at night, and consider utilizing aircraft to do this in order to minimize the disturbance and reduce personnel requirements.

20 Page 7, paragraph 3: We disagree with the proposed water development design. The development design selected should not intentionally build in periodic water hauling requirements

We recommend a shallow (36") (stealth) fiberglass ring tank system (~7000 gal.) situated at grade with complete "stealth" concealment. This design is proven and has been utilized for pronghorn elsewhere. This system will be large enough to accommodate the desert mule deer and other wildlife use that will inevitably occur regardless where the system is situated.

21 We recommend against the regulating of water availability. It is not clear./ understood how these and other ungulates will predictably react when water sources are ephemeral.

22 We recommend the strategic placement of pronghorn decoys to attract SP close enough to see &/or smell the water.

23 Page 8, paragraph 3: We prefer Alternative B in that the duration of the disturbance (water truck convoys) would be lessened and salinity problems with the water would likely be significantly reduced, though note the Goldwater Range Renewal LEIS (page 3-163) describes the groundwater on the range has been found to be of poor quality

24 Page 9, paragraph 6: The No Action Alternative states that by its selection, "opportunities to recover the SP would be forgone". We disagree with this and reiterate, we recommend the SP recovery agencies ought to be spending more of their time preparing the enabling documents & receiving sites so that when we have an expansion of SP, we can take advantage of it and actually translocate one or more herds

25 Page 17, paragraph 7: If the SP managing agencies are determined to pursue the Proposed Action, we recommend this section clearly state that if coyotes, or any other non-threatened predator, become either abundant to the point that they deter pronghorn use of the plots or are documented to prey on SP at the plots, that they will be controlled within a 5 mile radius of the treatment plots.

26 Page 18, paragraph 8: It appears to us that the obvious cost effective solution to undesired SP exploitation of high risk areas such as HE H1 is to merely fence them out of these areas

27 Page 22, paragraph 11: We recommend the bureau fully explore the concept of utilizing local contractors before committing substantial resources to this project. We know a project of this magnitude cannot be handled with current AGFD Development branch resources, particularly at that time of year when they are typically hauling water to numerous locales in Arizona. We alert you to recognize and plan for local contractors should be anticipated to rapidly lose interest in this project when they realize the damage being done to their tanker trucks while operating them in this type of environment

LITERATURE CITED

U S Fish and Wildlife Service. 1998 Revised Sonoran Pronghorn Recovery Plan. Albuquerque, NM. 70 pp.

CONCLUSION

Sonoran Pronghorn are representatives of an ancient and successful family. They have survived for thousands of years in deserts even hotter and more arid than the Luke Gunnery Range. They appear to have two requirements; Adequate space and minimal human disturbance to them and their habitat. Therefore, let us proceed cautiously to minimize the risk that we inadvertently deny them either of these in our continuing efforts to recover them.

We note that a mere 2 years ago, the proponents of this plan attempted to launch another ill-conceived SP project, in that case to place a poorly designed water development into a limited and critical tree cholla (*Opuntia fulgida*) stand. We hope the next morphing of the "need to do something" for SP reflects a 95% + staff effort. We hope it will reflect the consensus of the CWG and the numerous biologists that have Southwestern pronghorn management experience.

We appreciate this opportunity to comment and contribute. We look forward to a continuing dialogue with you.

Please provide us the opportunity to review subsequent drafts, comments, as well as a copy of the final document.

My best regards to you and your staff

John Gunn

John Gunn

JG:gg

cc:	David Brown	AAF	(via email)
	Jim DeVos	AGFD	(via email)
	Bob Henry	AGFD	(via email)
	John Kennedy	AGFD	(via email)
	Ray Lee	AGFD	(via email)
	Steve Rosenstock	AGFD	(via email)
	Bruce Taubert	AGFD	(via email)
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	Dave Hoerath	BLM	(via email)
	Susanna Henry	BLM	(via email)
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	Bill Broyles	FOC	(via email)
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	Bryan Morrill	MCAS	(via email)
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YUMA, ARIZONA

Ms. Gail Acheson
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Yuma, AZ 85365

Ms. Acheson

What follows are a few comments I have on the Draft EA for the Sonoran Pronghorn Forage-Enhancement Project. Additionally, I would like to state that I agree substantially with the positions outlined in comments sent to you by the Defenders of Wildlife et al. I appreciate the attempts by agencies to work to protect the Sonoran pronghorn, but I am not at all certain this is necessarily the way to do it.

Respectfully,

Jon M. Shumaker
Jon M. Shumaker
Concerned Citizen

SONORAN PRONGHORN HABITAT FORAGE ENHANCEMENT— COMMENTS

- P 1
- 1 | Is it only within the Goldwater Range the need for improved habitat has been identified?
 - 2 | The numbers here indicate a rising population
 - 3 | "Large home ranges suggest an overall low habitat quality." I disagree with this statement—it is an imposition of human values on population dynamics.
 - 4 | "... aggressive management to lessen the effects of human activity on Sonoran pronghorn range is necessary." So why not Air Force and Marine Corps departure, road closing, redo fencing, etc.?
 - 5 | "Fawn survival is the most critical component of the population dynamics of Sonoran pronghorn." Wrong to apply value to a particular component of population dynamics—we don't know what is critical (an earlier statement above makes a judgement of low habitat quality—if that is true, perhaps the low habitat quality leads to low fawn recruitment.)

"Probability of extinction " is a complex issue, of which recruitment is only a part

6 "The key to recovery of this endangered subspecies is through the recruitment of fawns into the population." Wrong. The key to recovery is restoration of range and habitat

P. 2

"Reproductive success and fawn survival are largely governed by environmental factors, particularly the availability of nutritious forage." I'm skeptical—no data. Again, restoration of original range and habitat is a bigger factor.

7 "The availability of preferred food items for pronghorn is dependent on the timing and amount of rainfall." This statement ignores the fact that pronghorn eat year-round, so there is a variety to their diet that probably fluctuates within seasonal parameters

8 How long do fawns nurse, and does this vary with the availability of forage?

9 "Additionally, a reproductive summer monsoon (thunderstorm) season is needed..." I have a problem with this entire paragraph. Where is the documentation for a statement about fawns dying without a productive monsoon? I think it again misses the point that this population is/was highly mobile, and would thus move over a large range, giving them access to areas that did receive rain. Also, "Two consecutive productive rainfall seasons are rare in the Sonoran Desert, leading to the need for management!" WHAT? This leads to the need for restoration of original range and habitat, and minimization of human impacts on population. Management becomes necessary when humans isolate a formerly free-ranging population and create for all intents and purposes an isolated island population under assault by the world's most powerful air force

The discussion of habitat/vegetation changes is not documented anywhere. The correlation between pronghorn areas and these changes is "in press" and thus not evaluated or even peer reviewed. I have a problem using "in press" to justify anything, especially a project of this magnitude

P. 3

Predators "undoubtedly" take pronghorn fawns (no citation, no data)

"...available data suggest that habitat condition is more influential on fawn mortality rate..." That's part of what I've been trying to say!

10 The idea of providing free water—there is no data that show this affects pronghorn populations. There is no data showing that human-provided free water is a boon, and there is no data showing that this is not actually harmful to pronghorn (see papers by Bill Broyles)

11 Where exactly does the goal of 500 pronghorn come from in order to de-list them? Is this based on science?

12 "Sonoran pronghorn numbers appear to fluctuate with forage conditions which are, in turn, dependent on rainfall." Appear? Reference for this? What are the natural population fluctuations in this area for this group over time?

13 "Other factors, previously suspected no longer considered significant " Why? What are all these factors? What about habitat fragmentation?

14 "Previous habitat improvement projects include the construction of reliable wildlife water sources such as Hollowill Tank..." Again, the need for this has not been determined

I vehemently object to the removal of animals until other measures, such as removal of the Air Force presence and habitat restoration have been attempted. If there are enough animals to experiment with, then there are certainly enough animals to utilize less intrusive and disruptive measures to restore their population

P. 4

14 The use of a hypothesis testing strategy seems to indicate that there really is no basis for this proposed action; that it is experimental and not based on actual data

15 This references BLM management plans, yet BLM is not going to be managing this land in the long term. What guarantee of continuity is there? Where are the Air Force and Marine Corps in this discussion, as they will be the primary land managers in the future? Where is Fish and Wildlife, and why aren't they adopting this strategy on their lands?

16 The idea that "sandy soils are more conducive to forage growth and persistence" is based on a single 40-year-old study, and it is being extrapolated that sandy soils are the same as sandy dunes? And what exactly are "heavier soils"? This is not a scientific term I have heard of. What characterizes them, and has a soil scientist been consulted on this project?

There is still no conclusive proof of why exactly pronghorn are found around bomb targets and HE Hill. Perhaps they are there because what was once optimum pronghorn habitat is now being bombed

17 2731 acres is absolutely outrageous for what is basically an experiment. Why this number? Why not a substantially smaller parcel? These changes will for all intents and purposes forever scar the land parcels in question for an outcome which is highly questionable at best. It is stated that parcels will be following along existing roads—this seems to be flawed in that the proximity to roads is a variable not controlled for in the experimental design

15 Once again the project is described in terms indicating a long-term commitment to the project, yet the Air Force and Marine Corps don't seem to be involved. What guarantee is there that the project will be continued? This must be addressed

19 | What is meant by "additional populations"? Aren't these animals all part of the same population? Are there questions here that haven't been answered? " the introduction of pronghorn into historic habitat ..." Unless historic habitat is returned to its previous condition, meaning removal of the military, bringing down fences, and road closures, then this will be a patently ridiculous waste of time and money. Also, how long until the efforts are "judged ineffective"? What is considered a reasonable length of time?

20 | Manipulations would be based on the characteristics of each site—what are these characteristics? Where is this information summarized? What is the baseline data? What logistics? The plan needs to specify these. " the occurrence of natural rainfall " Rainfall is a characteristic. Will there be weather-recording stations placed at each site? Why isn't this described?

21 | What kind of propane torch? This needs to be specified. Are we talking a flame-thrower? Is the wording of this meant to mislead people? For most people, a propane torch is something you work on your plumbing with

22 | "The removal of creosote would reduce plant competition, allow additional forb production, as well as increase openness. Aside from that last part, which is pretty obvious, what research shows the other parts to be true? Where are the references? Have you spoken with desert plant specialists who can verify these results?

23 | With regard to "no creosote bushes would be removed within a one to five-acre area" of cultural resources, what is this based on? Why have Native American tribes not been consulted on this project under the revised Section 106 of the National Historic Preservation Act? This project has been and still is in violation of the provisions of this act. In other words, it appears that you are breaking the law. Native American tribes may want a greater protective area around these sites, and possibly the establishment of Memoranda of Agreement for the continued protection of these sites. Site visits will probably be necessary before any action takes place. Have you identified these areas as being Sacred Sites or Traditional Cultural Places for Native American groups?

It is implied that not all of these plots are or will be near areas that pronghorn use. Then why are they being utilized? These areas of pronghorn use should be known, and the experiment designed with that in mind. "It is expected that creosote bushes would gradually become reestablished..." Where is the reference, and proof, for this? Are there plans to revegetate after the experiment is over? Creosote are notoriously difficult to propagate—how is this being addressed? How do you know these areas won't simply become superhighways for the invasion of exotic invasive plant species, especially because a number of these plots are along roads? And again a reference to the future without discussing a specific length of time. This is too open-ended

P. 6

24 | The idea of watering the desert to manipulate natural forb populations remains controversial. The literature does not indicate that what is being planned here will actually work. These plants do not exist within a vacuum. Is it possible that human

intervention in the life cycle of these plants could have long-term implications for their localized populations? And the reference Forsyth et al 1984 isn't even in the bibliography. Is this a made-up reference? Or is this indicative of the lack of attention to detail we will see during the length of this project?

25 | "Water would be applied frequently enough to enhance forage production goals of each plot." And this would be how much? Again, the science is not there. 2.5 lbs. of forage per day—based on how many individuals per plot?

26 | How do we know that the constant presence of water trucks, even at night, won't be yet another disturbance to the pronghorn, adding yet more stress to the population? Do they mind the presence of water trucks? And what about water quality? Will this be tested and controlled for as well? What about possible pesticide, herbicide, fungicide, nitrate, heavy metal, and salt contamination from irrigation water? Could this project create long-term problems by using contaminated water? Will you have to pay for the water? Who will pay the bill?

27 | Seeding would be done by hand—two thousand and some acres? And it appears that there will be no guarantee that the seed will be weed free. Do all of these species grow on the plots in question? Has a plant inventory been done for each site?

28 | A drip irrigation system will require installation and maintenance, once again requiring people to be out in pronghorn habitat. Are the affects of all this potential disturbance understood? Could this cause the pronghorn more stress and harm?

P. 7

Large equipment? What large equipment? This needs to be specified

29 | You are going to use traditional Tohono O'odham farming techniques, yet not one of these agencies has any experience with these techniques. You have had a single visit with any of the tribes. You presume that you can just go out there and do successful Ak-Chin farming without any experience or expertise. This is a big problem

30 | Once again you presume to understand the effects of water availability on pronghorn when you really don't. You cannot prove at this time that making this water available won't actually cause harm to the animals. Free-standing water would assist pronghorn in digesting high-protein forage? Where are the references? Which forage is high protein? I would also note that a lot of your referencing is based on single individual studies that appear to not have been repeated, thus making their conclusions far from a sure thing

31 | Aside from the Tohono O'odham Nation, you have once again left out a number of Native American tribes who are stakeholders in this area. You need to consult with these tribes and provide opportunities for their participation if they so desire

35 | Regarding your staging/camping areas, these too must be checked for cultural resources and cleared by a qualified archaeologist

36 | Why aren't the Marines offering funding for a project on their lands?

37 | Alternative B, the drilling of wells within the range, is completely unacceptable. The same questions about water availability and its possible negative affects on wildlife still need to be answered. It is also inappropriate to drill wells in an area of National Park quality. It would permanently mar the tranquility and undisturbed nature of this area (as does this entire project.)

Alternative C is the only acceptable alternative at this time, given the poorly thought out and badly designed Alternatives A and B.

15 | "Forage enhancement improvements may be considered in the future on the refuge " According to whom? Does Fish and Wildlife really sanction this action as an effective means to recover pronghorn?

P 9

38 | "3. Less plots " I think not only should there be fewer plots, there should be a single test plot outside of pronghorn habitat to work out whether or not this project is even feasible That is what a pilot study is really all about

10, 33 | "5 Forage Enhancements Only" Once again, the relationship of pronghorn with supplemental water has not been determined.

39 | Complete soil, vegetation, and wildlife profiles need to be done prior to any project of this nature in order to establish a baseline for measuring changes and impacts, whether positive or negative. This is basic science, and I am shocked that this work hasn't been done. This project has potential to cause changes in the Goldwater ecosystem, and if there are no baseline data, there would be no standard by which to hold government agencies responsible for their actions.

P. 11

26 | This project needs to prove beyond a doubt that the invasive alien species situation will not be exacerbated by this proposed undertaking, BEFORE the undertaking occurs

40 | It is inappropriate and unacceptable to destroy habitat in any ACEC if the purpose of designating an ACEC in the first place is to preserve/maintain habitat

41 | Fig 3--This diagram tells us very little. You mention a trough in the text, yet there is no trough represented in the schematic. A plan view would also be helpful

P. 16

25 | I am extremely disturbed at the assertion that Native American religious concerns have been determined to be unaffected by the proposed alternatives, when there has admittedly been no consultation whatsoever with any of the approximately two dozen or so Native American tribes who claim affiliation with the Goldwater area You don't know if there are any concerns, because you have not asked. Under the new Section 106 regulations of the National Historic Preservation Act, you are mandated to begin consultations with Native Americans at the front end of projects This casual business-as-usual approach to dealing with Native Americans is irresponsible and repugnant

39 | Impacts You need to determine the depth to which soils will be impacted

42 | If the water systems, which may not actually be a benefit to pronghorn (see previous comments), may only be temporary, perhaps the impacts would be lessened if they were left above ground rather than buried

9, 14 | P 17-18. You speak in glowing terms about the benefits of water improvements without citing a single source to back up your comments. Once again, this is an example of bad or even no science at all. This is unacceptable There is a difference between direct and indirect inference in science, and this document seems to demonstrate a lack of comprehension of this simple relationship Things are not facts just because it is easier for an agency to have them be that way. I want to see the data before you go out there mucking up an ecosystem more than you have already

43 | In 3) It seems that the implication here is that the point of all this isn't to protect and enhance the pronghorn herd and its habitat, it is actually to move the herd out of its habitat and get it out of the way of the Air Force That kind of tinkering with an endangered species could get you all sued

25 | Cultural Resources Again, you must consult with the tribes on how best to handle this Additionally, I demand that a professional archaeological survey be performed on all areas to be impacted by this project, including those supposedly surveyed already The results of the previous work are pathetic. I have very serious concerns about the qualifications, or lack thereof, of the people who performed the survey. The archaeology of this region is subtle, sparse, fragile, and sometimes easily missed even by appropriately trained professional personnel. The work previously undertaken must be redone professionally A bunch of amateurs, a biologist, and a single archaeologist do NOT a professional survey team make Redo it, and do it right this time

P 19

26 | Invasive species You intend to weed all of these plots by hand? Sure, whatever

40 | ACECs Again, no plots in these areas

P. 22

44 | You note that recreational use is expected to gradually increase. This would be something that can be addressed without destroying more pronghorn habitat as in the proposed action.

45 | If you are going to take credit for contributions to the local economy, you had better make sure you document it because any contributions would surely be minimal.

P 23

"Irreversible and..." You have not documented this. Some of these changes have the potential to be damaging and irreversible.

25 | Once again, I note that no Native American tribes, groups, or individuals were consulted on any of this. You are violating NHPA and President Clinton's Executive order on consultation with tribes.

GENERAL COMMENTS

This project is ill-conceived and not well thought-out. The science is questionable to non-existent. The proposed action is an experiment whose purpose appears to be to get the Air Force, Marine Corps, and other agencies off the hook rather than to do the right thing for pronghorn. There has been no attempt as far as I can tell to investigate other possible actions which would be less devastating to pronghorn habitat and ultimately have more beneficial effects on pronghorn. These would include shutting down the Goldwater Range, removing fences, and looking for ways to expand pronghorn habitat to some semblance of what it was in the past. The agencies involved in this project seem to be flailing about trying to do something, anything, right now. This is not appropriate. It is time to think big, to think outside of the box, to come up with creative solutions that actually stand on the back of facts rather than conjecture. It would appear that the Sonoran pronghorn have been forced into what is for all intents and purposes a constricted island-like habitat that no longer meets their needs. And yet you folks want to manipulate their habitat even more in some mad attempt to solve the problem rather than deal with causes that are already known. This is completely unacceptable. We are all in agreement that the pronghorn are important and need to be protected. If you want to try an experiment on a single plot outside of pronghorn habitat, (that also goes through NEPA and NHPA) to prove that this scheme actually works before you nuke 2000+ acres of pronghorn habitat, then I would reconsider. But at this point, I am firmly against this project. A project like this must be based on a firm scientific footing, or it's not worth the paper it's written on.

(6)



March 24, 2000

Garl Acheson, Field Manager
U.S.D.I. Bureau of Land Management
Yuma Field Office
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RE: COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT--SONORAN PRONGHORN FORAGE ENHANCEMENT (EA No. EA-AZ-050-99-045)

Dear Gail:

This correspondence is in response to the above referenced Environmental Assessment (EA) prepared for a proposed project to manipulate habitats to provide additional forage resources for the endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) on portions of the Barry M. Goldwater Range (BMGR). It provides general editorial comments on the EA, as well as additional comments on the project and the process that the BLM has followed during its preparation of the document.

COMMENTS ON ENVIRONMENTAL ASSESSMENT

1. **Purpose and Need Statement:** This section does not clearly state the purpose or need for the project. It provides a lot of extraneous information without really getting to the point. A good purpose and need statement needs to address the questions "why here" and "why now".

The purpose and need for the proposed action is not that federal agencies are mandated to conserve endangered species per *Sierra Club vs. Glickman*. This is good supporting information suitable for other portions of the document, but it has nothing to do with the purpose and need for the proposed action.

The EA states "the objective of the proposed project is to conduct research that will assist us in reaching a level of pronghorn sufficient to allow the removal of animals for the establishment of additional population(s) in the future." The statement does not clearly define the purpose of the project. At the meeting in Tucson (and in the Introduction of the EA), it was clearly stated that the purpose of the forage enhancement project is to increase forage available for fawns during critical times in an effort to increase the numbers surviving to adulthood. This statement is easy to understand and it clearly defines the purpose of the project. I suggest that you rewrite the purpose and need section of your document to reflect the information you presented at the meeting (and in the introduction).
2. During the public meeting in Tucson, BLM staff and others stated that the project was initiated (at least in part) in response to the terms and conditions of a U.S. Fish & Wildlife Service Biological Opinion regarding military training on the BMGR.¹ There is no reference to this Biological Opinion in the EA. Why?
1. The project is needed because during recent years, survival of pronghorn fawns under natural conditions has been extremely low and, therefore, there are very few "new" adults entering the breeding population for Sonoran pronghorn in the Unit.

¹ USFWS 1997 Biological Opinion for use of surface and airspace for military training on the Barry M. Goldwater Range which may affect the endangered Sonoran Pronghorn. USFWS Arizona Ecological Services Field Office, Phoenix, Arizona.

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March 24, 2000

States. Without increased recruitment into the adult cohort there is a high probability that Sonoran pronghorn will become extinct in the near future. The EA does not provide a clear statement of this "need."

2. Page 5; Paragraph 7, Line 8. insert the word "to" between the words "thinned" and "within"
3. Page 6; Paragraph 3. It seems that you should have sought permission to use water from the water holder before you got this far into the process. What happens if you cannot get permission from any water holders?
4. Page 7; Paragraph 3, Line 1. replace the word "is" with "in" between the words "pronghorn" and "digesting"
5. Page 9; Section III, Subsection B. big galleta grass is *Hilaria* ("Pleuraphus") *rigida*, not *H. berlandieri*
6. Page 10; Section III, Subsection F also Page 16; Section IV, Item 4. To my knowledge, no Native American Tribes have been consulted regarding the proposed project, nor were Traditional Cultural Places (TCP's) considered in the EA. I am not an archaeologist and make no pretenses about being an expert on the National Historic Preservation Act and other related federal laws. However, given that tribes have not been consulted, I question the validity of the statement that Native American Religious Concerns have been analyzed and would not be affected by any of the alternatives considered in the EA. Due to the scale and nature of the impacts associated with the proposed action, it may seem reasonable to assume that the project will not affect these resources. However, one should not reach this conclusion without talking to the people whose religious concerns are being addressed.
7. Page 16; Section IV, Subsection A1. The re-establishment of native vegetation in areas impacted by construction of buried free-water systems could be facilitated by seeding the disturbed site with native forbs and planting ported perennial woody vegetation.
8. Page 17, Subsection 2, Line 1. insert the word "of" between the words "establishment" and "additional"

ADDITIONAL COMMENTS

I understand that the Sonoran pronghorn is a highly imperiled species that is likely to go extinct unless actions are taken which increase its probability of survival. I also understand that increasing available forage for fawns during the early portion of their lives will likely increase their recruitment into the adult population and that increasing fawn survival is critical to the recovery of the species. I am in favor of supplementing available forage resources with native plant species and believe that the methods identified in the EA are preferable to hauling in alfalfa or other non-native plant species. However, given the critically low numbers of Sonoran pronghorn and the extremely dry winter we have had, I doubt that the proposed methods will be of any benefit this year and wonder whether we have time to "experiment" with methods to increase available forage. Even if the proposed project is initiated and it does increase available forage and fawn survival, it would be several years before we could expect any results from the proposed project. I suggest you contemplate some additional supplemental feeding programs which could "take the forage to the herd" this season and until the proposed project has a chance to "get off the ground." Perhaps there are some sources for hay or fresh vegetation mixes composed of forbs native to the Sonoran Desert.

Pronghorn are a culturally important species to the Tohono O'odham and the Wildlife & Vegetation Management Program of the Tohono O'odham Nation supports any effort to increase the likelihood of the species long-term survival. However, we are concerned about the way in which the forage enhancement project proposal and EA have been prepared. Specifically, BLM has been negligent with respect to communicating with Native American Tribes (particularly the Tohono O'odham Nation) and other affected and interested parties regarding the proposed project. The small turnout at the public meeting in Tucson reflects this lack of communication.

According to the EA, "the objective of the proposed project is to conduct research that will assist us in reaching a level of pronghorn sufficient to allow the removal of animals for the establishment of additional population(s) in the future." It is safe to assume the "additional population(s)" would be established within the historic range of the species, which includes lands on and adjacent to the Tohono O'odham Nation. Therefore, the proposed project directly affects the Tohono O'odham Nation.

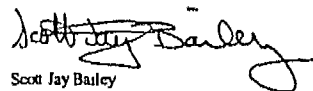
March 24, 2000

Secretarial Order 3206² directs agencies within the Department of Interior to "consult with, and seek the participation of, the affected Indian tribes." It also states that it is the responsibility of these agencies to "ensure that meaningful government-to-government communication occurs regarding actions taken under the (Endangered Species) Act." Therefore, the BLM should have contacted officials of the Tohono O'odham Nation early in the process of preparing this proposal and EA.

The BLM has not contacted the Tohono O'odham Nation to elicit input on the proposed project or to inform the Nation that public meetings were being held in Tucson and Yuma. No "government-to-government communication" occurred. In fact, the staff of the Natural Resources Department found out about the meeting in Tucson "through the grapevine" only a few hours before the meeting was scheduled to begin. I do not believe that notices in Tucson and Yuma newspapers and the Federal Register a few days before the meetings is adequate notice to tribal governments and clearly this does not constitute government-to-government communication.

It is regrettable that the BLM has failed in its responsibility to communicate with the Tohono O'odham Nation, other Native American Tribes, and other affected and interested parties regarding the proposed forage enhancement project. Failures such as certainly do not instill a sense of trust in the BLM. The Tohono O'odham Nation has the means to be an effective partner in such projects. One can only hope that the BLM will recognize this fact, make amends for their shortcomings on this project, and modify its approach on future projects. If you have any questions or require further information, please feel free to contact me at 520-4756.

Sincerely,



Scott Jay Bailey
Ecologist

cc: Edward D. Manuel, Chairman, Tohono O'odham Nation
Rita Martinez, Chair, Natural Resources Committee, Tohono O'odham Legislative Council
Peter Ruiz, Director, Tohono O'odham Natural Resources Department
Jonathan Jantzen, Assistant Attorney General, Tohono O'odham Nation
Peter Steere, Manager, Tohono O'odham Cultural Affairs Program
John Hervet, Arizona Game & Fish Department

² American Indian Tribal Rights: Federal-Tribal Trust Responsibilities and the Endangered Species Act. Secretarial Order 3206 signed June 1997 by U.S. Secretary of Interior and U.S. Secretary of Commerce.



7

Yuma County, Arizona
DEPARTMENT OF DEVELOPMENT SERVICES
 2703 S. Avenue B • Yuma, Arizona 85364

Harold Aldrich
 Director
 (520) 329-2300
 FAX (520) 726-5626

February 16, 2000

Gail Atcheson
 Field Manager
 Bureau of Land Management
 2555 East Gila Ridge Road
 Yuma, AZ 85365

RE: EA-AZ-050-99-045 Sonoran Pronghorn Habitat Forage Enhancement

Dear Ms. Atcheson:

The following comments are being submitted concerning the proposed Sonoran Pronghorn Habitat Forage Enhancement project within the Barry M. Goldwater Range

1. Socioeconomic Impacts: The proposed vegetation plots within the Barry M. Goldwater Range may be affected indirectly by two dairies that are proposed to be developed in the area. One Dairy is to be developed off of Aztec Road, Exit 73 south of Interstate Highway 8 and the second off of Spot Road, Exit 78 south of Interstate 8. Both Dairy sites will have developed waters and cultivated crops that may lure the antelope to the Dairy areas because of easy access to feed and water sources. If the Pronghorn Antelope are drawn to the cultivated lands they could become a nuisance to the farmers especially if the animals start grazing crops. In the event of these wildlife encroachments farmers may find themselves in the position of wanting to eliminate the nuisance themselves.

2. Air Quality and Health Issues: The proposed burning of creosote bush is a concern only in the potential health hazard exposure to those individuals who are burning the creosote they may inhale fumes causing respiratory infection. Also, those persons that will be disturbing the soil around the creosote bush need to be made aware that the soil under and around the creosote bush habitat is the micro environment for the fungus, *Coccidioides immitis* that causes Valley Fever in humans and dogs. It is advisable that persons working around the area where there are newly disturbed soil sites wear protective masks so not to breathe in fugitive dust that could contain cocci and cause Valley Fever.

There is an attached information pamphlet to provide to the field personnel working on the project

Monty M. Stansbury
 Planning Director
 Planning & Zoning
 (520) 329 2300

Curtis Canstar
 Chief Building Official
 Building Safety
 (520) 329-2290

Roger A. Patterson P.E.
 County Engineer
 Engineering Division
 (520) 329 2300

Roger E. Schoenherr P.E.
 Manager/Engineer
 Flood Control District
 (520) 329 2302

Gail Atcheson, Bureau of Land Management

February 11, 2000 Pg

3. Wildlife Issues:

3 A The mortality rates of young antelope needs to be further investigated. Perhaps forensic investigation of the carcass for respiratory damage could be done. In the desert area, the Desert Tortoise, dogs, cats and humans are prone to various respiratory diseases these diseases may also affect young antelope.

B. Predation by coyotes in the area is a valid concern and they indeed could contribute to the mortality of young antelope. Area sheep ranchers have reported that a privately hired trapper has trapped more than 125 coyotes in the Mohawk Valley, Tacna, Wellton and Dome Valley area in the past four months. There has been trapping of wild dogs. A local sheepman claims that the increase in coyotes migrating into populated areas and attacking domesticated livestock is due to drought in the desert.

C. The Forage Enhancement Project seems very viable. Increasing the Sonoran Pronghorn Antelope populations to the point of being able to transplant populations and to take the Sonoran Pronghorn Antelope off the U.S. Fish and Wildlife Service Threatened and Endangered Species List is very important. Also, having large populations of Sonoran Pronghorn Antelope that could be observed in the County could enhance the Eco-tourism Industry in Yuma County.

We support the Sonoran Pronghorn Habitat Forage Enhancement Project and encourage the development of similar sites within the National Wildlife Refuges that could be future transplant sites for the Sonoran Pronghorn Antelope.

If there are any questions concerning this reply contact me, (520) 329-2300 ext 173, FAX (520) 317-8302 or E-mail address is gaga@dds.co.yuma.az.us

Sincerely,

Gail Gallagher
 Environmental Planner

Enclosures: (1)

cc. Harold Aldrich

Monty Stansbury

GG/gg

L021100gg

g:\office\correspondence\gallagher\sonprantelope\p000 wpd

⑧

PUBLIC COMMENTS
Environmental Assessment
Sonoran Pronghorn Forage Enhancements

RECEIVED YUMA, ARIZONA

MAR 29 4 10 19

We welcome your comments on the draft environmental assessment for proposed experimental forage enhancements for the endangered Sonoran pronghorn.

You can write your comments below and either submit them to us tonight, or you may mail it to us at the address shown below. You can also submit more comments later if you wish, but they must be received before the comment period ends on March 24, 2000. Mailed comments postmarked on March 24th will be accepted.

Mail comments to:

Field Manager
Bureau of Land Management
2555 East Gila Ridge Road
Yuma AZ 85365

J P MELCHIONNE
MARY E MELCHIONNE
13477 EAST 44TH DRIVE
YUMA, ARIZONA 85367-6351

Name: J P MELCHIONNE

Address: 13477 E 44TH DRIVE YUMA, AZ 85367

Comments: I AM OPPOSED TO THE PROPOSED ENHANCEMENT PROGRAM.

I AM CONCERNED THAT FOLLOWING THE EXPERIMENTAL FORAGE
ENHANCEMENT PROGRAM, WHOLE TREES OF THE GOLDWATER RANGE
WILL BE ADDED TO THE "WILDERNESS AREA" DESIGNATIONS IN ARIZONA,
REQUIRE PROTECTIVE RESTRICTIONS FOR THE PROTECTED AREA -
WITH THE FINAL OUTCOME BEING CLOSING OFF OF THE GOLDWATER
RANGE FOR ANY MILITARY TRAINING.

IT SEEMS THAT THE EPA AND THEIR FRIENDS IN THE "ENVIRONMENTAL
MOVEMENT" HAS NO CONCEPT FOR THE HUMAN NEEDS - THE
ENDANGERED SPECIES ACT HAS BEEN DISTORTED TO THE POINT
THAT IT HAS NO CREDIBLE PROPOSALS. THE SONORAN PRONGHORN
IS A SUB-SPECIES - IS PLentiful IN MEXICO - AND THE REASON
FOR THEIR PROBLEMS IS WEATHER PATTERNS, NOT HUMAN INTERFERENCES.

JPM

28 FEBRUARY 2000

⑨

Brian F Dolan
511 E Roberta Circle
Tucson, Arizona 85704

March 21, 2000

Ms. Gail Acheson, Manager
Bureau of Land Management
Yuma Field Office
2525 Gila Ridge Road
Yuma, AZ 86365

Re: Sonoran Pronghorn Forage Enhancement Project
Draft EA-AZ-050-99-045

Dear Gail,

Thank you for allowing me the opportunity to review the Draft Environmental Assessment for the Sonoran Pronghorn Forage Enhancement Project (EA-AZ-050-99-045). I also enjoyed attending the public meeting held in Tucson on February 2, 2000. From the material received and the information provided at the public meeting I offer the following comments for your consideration.

I fully support the Recovery Team's proposed action under Alternative "A" for habitat forage enhancements on the Barry M. Goldwater Range. Proactive management activities for the endangered Sonoran pronghorn are long overdue and I believe that these study plots are a very important first step.

I must express my disappointment that the United States Fish and Wildlife Service (USFWS) is not allowing any of the study plots to be located on the Cabeza Prieta refuge. Since the Cabeza contains a significant portion of the pronghorn's primary range it appears obvious that some, if not all, of the study plots should be located on the refuge. In denying this alternative it is apparent that the USFWS is hindering the efforts and objectives of the Recovery Team and could likely compromise the goal of increasing fawn recruitment. This restriction is unnecessary and is contrary to the overall mission of the USFWS. The final EA should allow for implementation of forage enhancement on any portion of the Cabeza Prieta NWR as determined necessary by the Recovery Team.

I am similarly concerned that the Tactical Range alternative could not be pursued. Coupling this restriction with that of the Cabeza has limited the project to the northwestern most extremity of the pronghorn's range. If we were truly interested in the recovery of the pronghorn one would think that we would be performing these study plots where they would do the most good. It almost seems as though the locations were determined on the basis of administrative convenience rather than where they would offer the most benefit to the project.

Regardless of my concerns, I hope that the project, as presently outlined, can begin implementation at the earliest possible opportunity.

Sincerely,

Brian F Dolan

Brian F Dolan

March 11, 2000

10

Mike Seldman
6236 S. 10th St.
Phoenix, AZ 85040

Susanna Henry
Bureau of Land Management
Yuma Field Office
2555 E. Gila Ridge Rd.
Yuma, AZ 85365

Re: Sonoran Pronghorn Habitat Forage Enhancement

Dear Ms. Henry:

I recognize the good intentions of the BLM and AZGF Departments. Sonoran pronghorn populations are low and recruitment lately has been poor. Still, I am deeply disturbed by this proposal. It seems to be more of the kind of intervention into natural processes that created the problem. Even more worrisome to me, it represents another sad step toward the domestication of wild landscapes. This proposal is single-species management with a vengeance-- transforming an ecosystem to benefit one species. I do not find this to be an acceptable trade-off. Our meddling is part of the problem and the solution cannot be more of the same. Truly protecting species will require, not more ecosystem manipulation, but changes in human activities and life styles to those that support thriving ecosystems. This is my deep view of the subject. The rest of this letter is quibbling over details.

The EA says that reductions in the amount and quality of habitat has resulted in low pronghorn populations but the numbers say something different: populations are higher than they were back in 1924; no steady decrease is shown. How do we know that the little recruitment the last couple of years is not simply natural variation in an extremely arid environment? Natural cycles have been operating on these animals for thousands of years. Adult pronghorn are fairly long-lived; won't females successfully reproduce when the rains come again? I do not like

experimenting with these animals.

2 The EA says nothing about the population in Mexico which I believe contains more, perhaps twice as many, animals. Is the State putting as much effort into maintaining corridors between the US and Mexico as it is willing to put into habitat manipulations? What are the differences in habitat between the US and Mexico? Why do Sonoran pronghorn appear to be doing better there?

3 Fragmentation-- obstacles to movement and/or recolonization-- and not habitat per se, may be the cause of low populations. 500 animals is a neat optimal number in the abstract but is there any evidence that 500 animals ever lived in the area of Arizona that Sonoran pronghorn are currently confined to or that the area and habitat can support that many pronghorn without movement to and from Mexico?

5 Pronghorn numbers have not increased in most other areas of the state, e.g. the Empire Ranch or Buenos Aires, and in fact pronghorn numbers have been decreasing all through the west, perhaps from drought. I haven't heard forage enhancement suggested elsewhere.

6 The claim is made that "two consecutive productive rainfall seasons are rare in the Sonoran desert, leading to the need for management". This is the sort of statement I find troubling. I don't see that the conclusion follows from the premise. And I don't like the casual smugness with which the need for heavy management is invoked. This is a desert. Animals have lived in it for thousands of years and are adapted to aridity. Of course most species will increase their numbers following wet years and decline with loss of productivity after dry years (or a series of dry years). This is the natural course of things in the desert (as elsewhere). One gets the impression reading this document that the agencies resent the desert because of that variability and believe their job is to smooth it out (i.e. make the desert something else) ! Water may be the limiting factor for desert game species but that's what makes it a desert. Let it be a desert and not a game ranch. There is no proof that Sonoran pronghorn even need to drink water.

8 And this project is likely to change the ecosystem in some ways. Predators for instance are likely to benefit as well as pronghorn. In denying that more water may lead to increased predation, the claim is

8 made that habitat condition is more important to fawn survival than
predation. This may be so but it misses the point that more water might
draw in more predators, as they will benefit from the water and learn to
9 expect to find prey animals there. In addition, exotic plants such as
Brassica or buffel grass may well establish themselves on the disturbed
sites.

10 What if the project succeeds, if pronghorn numbers-- and perhaps other
species' numbers-- are made artificially high? Will we commit to
sustaining these practices into the far future to support a population
completely dependent on people? The State might just as well transplant
all Sonoran pronghorn into a grassland someplace or bring them into
captivity forever! It seems we are more disposed to do either of those
things than confront the real issue of human encroachment into their
habitat.

I thank you for this opportunity to comment.

Sincerely,

Mike Seldman

Mike Seldman



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD PHOENIX AZ 85023-4399
(602) 942 3000 • WWW.AZGFD.COM

GOVERNOR
JAHIL DEL PUECO
COMMISSIONERS
CHAIRMAN W. HAYS GILSTRAP PHOENIX
DENNIS D. MANNING ALBUQUERQUE
MICHAEL M. GOLDBLATT FLAGSTAFF
JOE CARTER SAFFORD
WILLIAM BLUMHART TUCSON
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVEN K. FENNEL

March 23, 2000

Ms. Gail Acheson, Field Manager
Bureau of Land Management
Yuma Field Office
2555 East Gila Ridge Road
Yuma, Arizona 85365

Re Draft Environmental Assessment No. EA-AZ-050-99-045 Sonoran Pronghorn Habitat
Forage Enhancement Project

Dear Ms. Acheson:

The Arizona Game and Fish Department (Department) has reviewed the draft Environmental Assessment (EA), dated February 2000, to enhance the quality of habitat for the Sonoran pronghorn within the Barry M. Goldwater Range (BMGR). Consistent with the Revised Sonoran Pronghorn Recovery Plan and recommendations from the Sonoran Pronghorn Recovery Implementation Team, this project would create high-quality habitat and provide a temporary supply of free-standing water for Sonoran pronghorn on the BMGR.

The Department supports proactive habitat management for the Sonoran pronghorn, and we appreciate the Bureau of Land Management's (BLM) efforts in developing this draft. As you know, the Department has been involved in the development of this EA and we support the existing collaborative efforts to develop habitat improvement projects that are consistent with the recovery goals for Sonoran pronghorn. The Department would like to meet with BLM to discuss the Proposed Action and other alternatives specific to water delivery, prior to finalizing the EA.

We look forward to working cooperatively with the involved agencies to implement this habitat enhancement project for the Sonoran pronghorn. Please contact John Hervert at (520) 342-0091 to discuss this project and issues associated with providing water to the experimental forage plots. Thank you.

Sincerely,

Duane L. Shroufe
Duane L. Shroufe
Director

cc John Kennedy, Project Evaluation Program Supervisor, Habitat Branch
John Hervert, Wildlife Program Manager, Region IV, Yuma

RECEIVED YUMA, ARIZONA
MAR 27 19 13
BUREAU OF LAND MANAGEMENT



12

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

2 0 FEB 2000

MEMORANDUM FOR 56 RMO/ESM

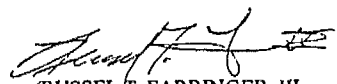
FROM: HQ AETC/CEVN
266 F Street West
Randolph AFB TX 78150-4319

SUBJECT: Draft Sonoran Pronghorn Forage Enhancement Project Environmental
Assessment (EA)

1. We reviewed the subject document, and our comments are attached. In general, the document analyzes environmental impacts of the proposed project, but it is short on some important details. For example, what is the duration of proposed project? Who decides the size of buffers around cultural resources sites? Who will make these decisions (at a minimum, attribute decisions to respective agencies)? Addressing these sorts of questions and our other comments will improve the understanding of the project by both the general public and the decision-makers.

2. Please forward our comments, along with yours, to the Bureau of Land Management (BLM) for incorporation into the document. Then, after appropriate legal review and staffing, the Finding of No Significant Impact can be jointly signed by the two agencies

3. Should you have any questions or require further information, please call our POC, Ms Marion Erwin, HQ AETC/CEVN, at DSN 487-3656


RUSSEL T. FARRINGER, III
Acting Chief, Environmental Planning Branch
Environmental Division
Directorate of The Civil Engineer

Attachment:
Comments

cc:
HQ AETC/JAV
BLM (Yuma) w/o atch

RECEIVED
11 FEB 2000
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Comments on the Environmental Assessment for the Sonoran Pronghorn Forage Enhancement Project 28-Feb-00					
#	Page	Line	Section	Comment	Reviewer
Substantive Comments					
1	3	15-18	I A.	Per HQ AETC/JAV, transfer of natural and cultural resources management responsibility to MCAS and LAFB occurred with passage of legislation. What occurs over next two years is relinquishment of non-renewed lands. Note CPNWR is managed by USFWS. This needs to be more fully explained. Perhaps figures, which I don't have, already do. Same comment applies to III E.	M Erwin
2	4	24-27	I C.	EA states project is in conformance, but how? Briefly summarize land use plan(s), so readers can see how project fits into big picture.	M Erwin
3	4	28-31	I D.	EA states project is consistent with other plans, but reader must take this on faith. What do other plans envision for project area? Briefly summarize other plans, so readers can draw their own conclusions.	M Erwin
4	5	11-15	II A	Confusing. 11 + 4 = 15 (not 14). Evidently one plot contains two sites. Needs better explanation.	M Erwin
5	5	17-21	II A	Project Duration Line 17 What "range?" BMGR? Or SPH habitat range? Line 18 What "removals?" Removals of what? Line 19-21. Who decides when to discontinue? How is success or ineffectiveness determined?	M Erwin
6	5	38-45	II A	Creosote Removal Line 38 Who decides size of buffer around cultural resources? How is size of buffer determined? (I don't have Fig 2 which may provide explanation.) Line 42. What is definition of "near?" Line 45 Removing creosote with propane torch doesn't sound "easy" to me.	M Erwin
7	6	3-21	II A	Water Application Line 3 Are there control plots? Would vegetation on unwatered side of road be control? If so, this needs to be explained. Line 15 What are specific goals for each plot? Will there be different watering regimes to effect a range of vegetation density (lushness)? Line 21 What is definition of "in the area?"	M Erwin
8	6	26	II A	Native Seeding What is definition of "enough" forage?	M Erwin
9	6	38	II A	Planting/Irrigation What is irrigation regime? Nighttime? Daytime? Automatic timer? Moisture probes?	M Erwin

10	7	8	II.A.	Water diversion manipulations. What are "traditional Tohono O'odham farming techniques?"	M Erwin
11	8	7	II A.	Camping/Staging Areas. Five sites are located within MCAS jurisdiction, but no funding is being offered by MCAS Or USFWS, who are charged with recovering species. That doesn't seem right.	M Erwin
12	8	--	II B.	Alternative B.. At end of project, what is planned disposition of wells and their associated appurtenances? Left in place? Pulled? Plugged? Capped?	M Erwin
13	10	31	III F.	Cultural Resources Who is deciding size of buffer(s) around cultural resource(s)? Why hasn't size of buffer(s) already been determined? When will decision be made?	M Erwin
14	11	12, 22	III J.	Recreation Line 12. I thought there was one access permit system. This sounds like there are at least three permits required. Wouldn't permit(s) also be needed from AGFD (for hunting) and/or USFWS (for access to CPNWR)? Needs better explanation Line 22. Identify accessible sites.	M Erwin
15	13	45+	IV A 2)	Disease Last two sentences in first paragraph seem to contradict each other. Be consistent.	M Erwin
16	15	29	IV A.8)	Recreation. Contradiction. Here six sites are accessible In Sec III J. only four sites are accessible. Why difference?	M Erwin
17	16	11	IV.B 1)	Soils and Vegetation Another contradiction Here six sites are 0.015 km ² . In Sec II A, there are only four such small sites. Why difference?	M Erwin
18	17	4	IV.B 6)	Climate and Air Quality Also less carbon monoxide emissions	M Erwin
19	18	21, 23	IV C.	Cumulative Impacts Line 21. Shouldn't National Guard and Reserves also be listed? Line 23. Delete "testing and "	M Erwin
20	23	24	FONSI	Decision. For Central San Cristobal, is it T 10S as here, or T. 9S as in Table 1?	M Erwin
21	23	36	FONSI	Rationale for Decision. "Barry Goldwater East Habitat Management Plan" is not even mentioned in Environmental Assessment	M Erwin
22	25	10	App A	1. H ₀ . What are "anovas?" Or "ANOVAS," as in 4 H ₀ ?	M Erwin
23	--	--	--	Permits Are any permits required to implement project? Are permits required to install wells in Alternative B?	M Erwin

				Comments on Format	
24	3	7	I A	When first used, spell out what acronym "CIDESON" stands for.	M Erwin
25	5	5	II A	Change "Goldwater Air Force Range" to just "Goldwater Range "	M Erwin
26	5	27	II A	Change "fire and evidenced" to "fire as evidenced "	M Erwin
27	8	30	II C	"Forgone" (gone before) is not correct word Opportunities are still there, they just won't be taken advantage of at this time	M Erwin
28	9	22	II D 5	Delete "in" between "assists" and "the pronghorn "	M Erwin
29	9	27	III A.	Correct "aluvium" to "alluvium."	M Erwin
30	11	11	III J	Change "occurs" to "occur" and "is" to "are" to agree with plural subject.	M Erwin
31	11	41	III M	Change "lie" to "lies" to agree with singular subject	M Erwin
32	14	8	IV A 2)	Correct "concensus" to "consensus "	M Erwin
33	14	35, 38	IV A.3)	Line 35 Change "Goldwater Air Force Range" to just "Goldwater Range " Line 38 Shouldn't these be included in "References Cited?"	M Erwin
34	15	30	IV A 8)	Correct "plotss" to "plots "	M Erwin
35	15	38	IV A 10)	Add "of" at end of line between "amounts" and "Sahara mustard "	M Erwin
36	15	45	IV A. 11)	Change "plots" to "plot "	M Erwin
37	16	2-3	IV A 11)	Second sentence is incomplete What would "establish the temporary free-water system " It is not "burning," as currently written	M Erwin
38	16	22	IV B 2)	Add "of" between "establishment" and "additional "	M Erwin
39	17	17	IV B. 10)	Add "be" between "expected to" and "the same "	M Erwin
40	25	19	App A	2. H ₀ Change "preformed" to "performed "	M Erwin
41	25	38	App A	4. H ₀ Change "verses" to "versus "	M Erwin
42	--	--	--	Will vs. Would: Document sounds like decision has already been made because of liberal use of "will" when "would" should be used	M Erwin
43	--	--	--	Utility of document could be improved by adding such niceties as page numbers, table of contents, table comparing alternatives, executive summary, and abstract	M Erwin

Rt 2 Box 641F
Laveen, AZ 85339

(13)

March 2, 2000

TO Author's of *Sonoran Pronghorn Habitat Forage Enhancement*

I have received and reviewed a copy of the draft environmental assessment *Sonoran Pronghorn Habitat Forage Enhancement*. To my knowledge this project adequately addresses the need to improve fawn survival of the endangered Sonoran pronghorn population within the Barry M. Goldwater Range. I would also like to express my interest in volunteering to participate in this project. If additional volunteers are needed in the near future (i.e., before mid-May), I could relay information to members of our student association (Environmental Resources Student Association, ERSA). Please inform me of any developments on this project or any need for volunteers. Thank you.

William D Sommers IV

William D. Sommers IV
(william.sommers@asu.edu)
Senior, Environmental Resources
Arizona State University East
Mesa, Arizona 85212

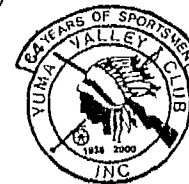
Yuma Valley Rod & Gun Club, Inc.

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POST OFFICE BOX 10450 • YUMA, ARIZONA 85366

Ms. Gail Acheson, Manager
Bureau of Land Management
Yuma Field Office
2525 Gila Ridge Road
Yuma, AZ 86365

February 10, 2000

RE Support For Environmental Assessment For Sonoran Pronghorn Habitat Forage Enhancement Project (EA-AZ-050-99-045)

Dear Gail,

On behalf of the Yuma Valley Rod and Gun Club (YVRGC), I would like to thank you for the opportunity and for providing members of your staff to participate in the public meeting regarding the forage enhancement project presented to the public on 2/09/00 at the Yuma Field Office. It is our belief, all stakeholders who have an interest in the recruitment of pronghorn, thus increasing the population by providing forage and water, support this project. This was clearly apparent when attendees of the meeting questioned the Recovery Team having to wait the next 60 to 90 days for the NEPA process to allow for the necessary signatures on the Record of Decision. It should be known those presenting (AGFD, USAF, BLM) made it very clear the process was not going to be accelerated. It was also noted and made clear that it is imperative to fully complete the process to ensure litigation would not impede the project.

It should be further noted attendees addressed the issue of the Recovery Team not having permission at this time to implement this project as proposed on refuge lands. It is our belief, Mr. Don Tiller, Manager of the Cabeza National Wildlife Refuge (Cabeza) will probably be receiving letters asking for the United States Fish and Wildlife Service to join in the Recovery Team's efforts to enhance Sonoran Pronghorn with this project on the Non-Wilderness portions of the Cabeza immediately.

We thank you in advance knowing your's and Colonel White's signature will appear where necessary to fully implement this project as soon as possible. We further respectfully request for your support to the fullest extent possible, ensuring immediate allowance for implementation of forage enhancement for Sonoran Pronghorn on Cabeza.

Sincerely,

Jon Fugate, Chairman
Legislative Affairs

15

People for the USA

Yuma Chapter People for the U.S.A., PO Box 25182 Yuma Arizona, 85367


Greetings,

On February ninth of this year several of our members and myself attended a public hearing concerning the sonoran pronghorn habitat forage enhancement issue. In all candor I must confess that we were prepared to lock horns and do battle with what we expected to be another remote and haughty body of bureaucrats bent on dictating more resource withdrawal from public use.

Instead we were pleasantly surprised to find the presentation and presenters fraught with genuine concern of not only their charge but the concerns of we citizens.

Gifford Pinchont, the first chief of the Forest Service, coined the word, Conservationist, he defined it as the wise use of a natural product. The project presented exemplifies that paradigm, employing common sense, long range consideration of aspects of flora, fauna, and the community of humanity that coexist in that same environment.

If management of our resources is to be conducted thus, then we whole heartedly endorse that program.


Dale M. Marler, President, Yuma Chapter
P.f.t.U.S.A.

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1 - "...that BLM should first construct and operate a forage enhancement plot" and "BLM's failure to analyze this more modest approach would violate NEPA."

A single plot, in an experimental setting or not, does not address the immediacy of the project and will not provide enough quality information. Without replicates, there is little scientific evidence (rigor) to be gained by the experiment. A single plot will provide little or no nutritional or water benefits to the pronghorn population (especially outside pronghorn habitat) and can be missed by rainfall events entirely by chance for years on end. This project is targeted to provide both information and resources to pronghorn now.

2 - "...plot...operated for an entire year"

The design does not require the plot to be operated for any longer than the forage stays green and can be utilized by pronghorn. The intention is to produce forage in late spring-early summer. Operation outside this time period is not within the study design.

3 - "...there is no evidence ... that the methods it (BLM) proposes to use will result in an increase in forage for Sonoran pronghorn..."

This statement is contrary to the natural experiment played out every wet winter in the Sonoran desert. It is the foundation of our spectacular wildflower blooms. The design will attempt to mimic these wet conditions that lead to spring production. Experts from the Desert Botanical Garden, Wild Seed, and the Arizona-Sonora Desert Museum have agreed that our methodology is sound and that some reasonable expectation of forage production will follow. The study design is two-fold - to see how well the technique works (and how to refine it), and see if pronghorn will use these areas. Production of substantial amounts of forage is not a goal of the project and is superfluous relative to 130 pronghorn ranging over 2,000,000 acres.

4 - "...this project will cause irreparable harm to an extensive region of fairly pristine desert."

Use of the words "irreparable" and "extensive" are relative when discussing the magnitude of this project. The real impacts of the project are both small and temporary for the most part. The revised Proposed Action involves only 18.5 acres of surface disturbance (irrigated areas) over 10 plots. Thinning/creosote removal will occur on 8.03 km², but it is not a complete removal. This acreage totals less than 1984 acres in over 2,000,000 acres (0.09 percent) of Sonoran pronghorn habitat; and an even smaller percentage of the Sonoran desert. Some loss of creosote (a common resource) is acceptable when preserving an endangered species.

5 - "...this project opens an enormous door for non-native invasive species..."

The Proposed Action has been modified so that no commercial seed would be used and includes the removal of bufflegass. We believe that there are plenty of natural seed sources out there (taking a lesson from the natural experiment). This removes the greatest potential for introduction of additional non-native invasive species.

6 - "What are the specific goals for each plot?"

There are no plot-specific goals, nor were there any meant to be portrayed in the Proposed

Action. The overall study goals have been reduced and refined. The experimental rigor has been changed to reflect the fact that we could probably not determine what benefits resulted from particular treatments. The current study design reflects the expected combined effects of openness, water, and green forage. The study would not determine single effects of each treatment.

7 - “Does BLM have an idea about how frequently water will have to be applied to achieve a specific goal?”

The Proposed Action has been expanded to describe watering frequency.

8 - Seed questions

No commercial seeding, see #5. The Proposed Action continues to include the potential to gather and use seeds from native plants at or near the plots.

9 - “consider a meaningful range of alternatives...”

A meaningful range of alternatives is considered in the revised Environmental Assessment. A “meaningful” range of alternatives must address the question at hand (pronghorn fawn mortality). The Proposed Action investigates and partially implements steps 1.1, 1.2, and 1.3 of the Sonoran Pronghorn Recovery Plan.

10 - Discussion of the need for an EIS related to significant impacts to the human environment.

(A) - “habitat manipulation... on an area nearly 4 square miles?”

See discussion of “extensive” in #4 above

(B) - “construction of up to 50 “small” dams.”

This element has been removed from the Proposed Action, due to its inappropriateness for nearly all of the revised Proposed Action’s selected sites (it was to be used on only 5 of the 14 sites in the draft Environmental Assessment). It has been retained in the Alternatives section.

(C) - “using backhoes and other heavy equipment to excavate earth...”

The use of heavy equipment is a temporary impact to the environment as analyzed in the Environmental Consequences.

(D) - “thousands of truck trips...”

The Proposed Action has been revised to use a sprinkler system with wells at seven of the plots, greatly reducing the number of vehicle trips required. The number of plots has also been reduced from 14/15 to 10.

(E) - “thousands of vehicle trips (or more) for monitoring...”

The great majority of the monitoring information will be gathered from the radio-tracking flights that already occur. Use of the plots by pronghorn can be determined from the air or from remote cameras. Thousands of vehicle trips for monitoring is not a substantial part of the Proposed Action. We will not jeopardize the potential for success of this study with substantial disturbance.

(F) - “in Alternative B, the construction of up to 6 water wells, including noisy gasoline pumps,

without any commitment to remove these facilities when the project is over (whenever that is), and without any consideration of impacts to the local aquifer or hydrology in this desert environment?”

Alternative B from the draft Environmental Assessment has been modified to be part of the Proposed Action in the revised Environmental Assessment. A sprinkler system would be operated from a distance to minimize human presence and noise at the plots. Removal of the systems may or may not be appropriate depending upon the results of the study. Hydrologists have been contacted and impacts to the groundwater have been analyzed and addressed in the revised Environmental Assessment.

(G) - “the potential for introduction and enhancement of exotic Sahara mustard...”

Sahara mustard is extant (in patches) throughout the Sonoran desert; the activities of the Proposed Action are expected to have no impact on its distribution or spread.

(H) - “an experiment of indefinite (and potential *sic*) infinite) duration.”

The Proposed Action now includes a time schedule. The ultimate duration of the project is discussed under Cumulative Impacts.

11 - “degree to which the effects on the quality of the human environment are likely to be highly controversial”

The Proposed Action is not controversial or contentious among the community of Sonoran pronghorn experts including the Sonoran Pronghorn Recovery Team. Neither Mr. Broyles nor Mr. Gunn are recognized Sonoran pronghorn experts. Mr. Broyles' 1995 article in The Wildlife Society Bulletin is an opinion piece, not a peer-reviewed study. Mr. Broyles more recent study with Ms. Tricia Cutler (The Wildlife Society Bulletin, 1999) concerns desert bighorn sheep and water.

Opinion aside, it is circular reasoning to argue that limited research has not shown water to be important to desert wildlife (desert bighorn in the above-mentioned paper) - so we should not do more research that might show importance. Sonoran pronghorn have been observed drinking water, and numerous peer-reviewed studies on the American subspecies of pronghorn have shown water to be beneficial to pronghorn. The Interior Board of Land Appeals has ruled that “Mere differences of opinion provide no basis for a reversal of BLM’s decision if the decision is reasonable and supported by the record on appeal” (Weaver and Shaw vs. BLM, 1997).

12 - “Given that this project is an experiment, that its design is vague, that this is the first time anything like this has been attempted on this scale for an endangered species, the impacts to the desert environment and to the pronghorn itself are highly uncertain.”

See #10 and #11. The Proposed Action pales in comparison to the management required for the California condor, black-footed ferret, Mexican wolf and red wolf. The Environmental Assessment covers the impacts of the alternatives in the Environmental Consequences section.

13 - (from CEQ) “degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.”

There are no proposals beyond establishing and testing the 10 plots for up to 7 years. The assertion that the Proposed Action “using habitat manipulation practices to create artificial habitats to aid in the recovery of listed species” would “set a dangerous precedent” is not true. Intrusive,

artificial management for endangered species is commonplace, and has been performed for several species at the ultimate scale - the entire population (see above discussion). Reestablishment back to the wild with these three species was accomplished with highly artificial home sites/acclimatization pens and supplemental feeding. Similar transplant techniques have been used with whooping cranes, bald eagles, and peregrine falcons. The latter two species have been recently delisted or downlisted. Migratory waterfowl management for listed species (black brant or cackling Canada geese) or species in trouble (Canvasback and Mexican duck) involves substantial habitat manipulation (farming, artificial ponds, man-made nesting islands) and even predator control. Artifice should be no barrier to endangered species recovery, and has not been.

A similar project, much more intrusive in nature, is currently being conducted in Mexico for the endangered peninsular pronghorn (Cancino et al. 2000). There, pronghorn are in a large enclosure (1 km²) set-up which provides security, green forage, and water in an effort to provide healthy conditions that promote natality and recruitment.

14 - (from CFR) "whether the action is related to other actions with individually insignificant but cumulatively significant impacts"

Other actions are addressed in the Cumulative Impacts section of the Environmental Assessment, including the proposed transportation system.

The Recovery Team and U.S. Fish and Wildlife Service both believe that the predicted outcome of the Proposed Action will likely have a positive impact on Sonoran pronghorn, essentially lessening the apparent burden/negative cumulative impact facing them. Negative aspects, certainly cumulatively negative impacts, concerning SP are not foreseen for this project. This project is in response to the U.S. Fish and Wildlife Services Biological Opinion for "Use of Ground-surface and Airspace for Military Training on the Barry M. Goldwater Range which May Affect the Endangered Sonoran Pronghorn" (2-21-96-F-094). The Proposed Action is in response to this Biological Opinion which includes a "Take Statement."

The call for "definitive information" in a cumulative effects analysis involving biological elements is not consistent with a clause involving predicting the future, regardless of the Ninth Circuit Court ruling (pp7).

15 - "the DEA contains no mention of the location of the proposed forage enhancement plots in relation to ongoing military activities, particularly military training routes"

The Proposed Action selected sites for the plots in and near areas already used by Sonoran pronghorn, even with the current military training and law enforcement activities. The military training routes end once inside the Goldwater Range and the entire area is termed a MOA - Military Operating Area, where planes go wherever they want.

16 - "the DEA contains no mention of the extent to which the Border Patrol or other law enforcement agencies use the routes off of which the forage plots will be constructed"

See #15. Border Patrol activities are not part of the Proposed Action, but are discussed in the Cumulative Impacts section.

17 - Establishment of future pronghorn populations through transplants

Transplanting Sonoran pronghorn is not part of the Proposed Action or this Environmental Assessment. If undertaken in the future, transplanting would require separate NEPA documents to

be prepared.

18 - “the AGFD and BLM have, with respect to artificially provided water, begun to argue that such provided water cannot ever be eliminated because illegal aliens have come to depend on such water for survival.”

The draft Environmental Assessment contained no such language. Based on this comment, we have added the possible use of the temporary free-standing waters by undocumented persons to the Cumulative Impacts section.

19 - “...the extent to which the proposed action may result in the creation of a subpopulation of Sonoran pronghorn who come to depend so heavily on the enhance (*sic*) forage plots at a certain time of the year that they too will come to depend on these artificial habitats and may be unable to survive without them...”

The plots try to mimic or create the natural systems or habitat that these species need or prefer - that are not present. But like nature, both the green-up areas and water will be ephemeral and pronghorn will continue to wander in search of forage, just like they do now.

20 - “A detailed response...”

This is provided (Appendix C).

21 - “Notification of the public’s right to protest, appeal, or litigate the proposed action.”

This is done when the Record of Decision is issued.

22 - Recovery Implementation Team and NGO issues

The Service is represented on both the Recovery Team and Recovery Implementation Team by members of both the Ecological Services and the Refuge sections (Cabeza Prieta National Wildlife Refuge). This was an error of omission. The NGO’s have had input into this project since it was first included in the Recovery Plan. NGO’s were invited to participate on the Recovery Implementation Team but declined when they found out that they could not be a part of the Recovery Team due to FACA (Federal Advisory Committee Act)

23 - Holiwill Tank

This site was not an experiment, but showed that Sonoran pronghorn will use free-standing water. It is but one site; one background data item. See also argument for circular reasoning in #11.

24 - “Are the 14 plots identified in the DEA the only possible locations...”

The 10 plots remaining in the Proposed Action are the best locations for the plots, given the areas we were allowed to work in. Offering 15 (or 10) other alternative sites would be creating alternatives for alternatives sake, which is contrary to NEPA and CEQ guidance and intent. The decision-maker is of course allowed to select portions of the Proposed Action or otherwise modify it in the Record of Decision.

25 - working/constructing near areas that Sonoran pronghorn are using

Disturbance from working in these areas will be minimized. The purpose of the study is to determine if the plots will improve the fitness and recruitment of the Sonoran pronghorn that use

them. If they are placed in areas that pronghorn do not use, no test data will be gathered and no benefits will accrue to the pronghorn.

26 - Monitoring/Success determination

There will be an annual report prepared by AGFD. This will supplement the Biological Opinion reporting requirements of the Air Force and will help the Recovery Team in its mission. The success or failure of the plots should be apparent when either pronghorn do or do not use (and benefit) from the plots. The Proposed Action now includes a Schedule and a 7-year study window. Success will be shown by pronghorn use of plots and increased fawn survival. Failure would be shown with opposite or static trends. Negative impacts or lack of results may be difficult to attribute to the study.

27 - Water Rights

This has been addressed in the revised EA.

28 - Site-specific data

The sites are similar with the same assemblages of plants, slopes, and aspects. Naturalness will not be "degraded" at the plots. They will merely appear as if it has rained on the plots, much like the mosaic that occurs every year with the sporadic and localized nature of desert rain.

29 - "The discussion of artificially provided water fails to cite or address adequately information concerning the detrimental impacts of the same as disclosed in Broyles 1995 article."

See #11 above

30 - Bees/native pollinators

This is discussed in the Environmental Consequences section of the Environmental Assessment.

31 - "this project may destroy some of the natural values of ROADLESS areas"

This discussion is not germane to the Proposed Action in that no new roads are proposed or associated with it. The use of existing roads is just that, and does not impair wilderness suitability. Roadlessness is but one of the characters of wilderness. The discussion of the suitability of a well-roaded active military gunnery range traversed at low-levels by supersonic flights of jet aircraft belongs elsewhere. Military withdrawn lands were not considered for wilderness since military use of the ground surface is felt to preclude wilderness.

LETTER 2 - DEFENDERS OF WILDLIFE

1 - "Additional detail is required in the DEA to ensure that the public understands the proposal and can prepare substantive comments on the environmental impacts of the proposed action." And "...the analysis of impacts should also be more detailed..."

The Environmental Assessment has been modified and refined to provide the decision-maker and the public the best document possible, including a schedule, a simpler Proposed Action, a better

discussion of alternatives and their impacts.

2 - “the range of alternatives offered should be expanded to reflect a reasonable range of alternatives” and Item 3 (range of alternatives on page 6 of Defenders letter).

See #9 in Letter 1.

3 - Item A (single plot, production quantity) [also Item 2, page 4 of Defenders letter] and item B (need for an EIS).

See #'s 1, 2, 3, and 6 in Letter 1 dealing with single plot, validity of the technique, and production. See #'s 10 through 18 in Letter 1 regarding the need for an EIS.

4 - Item C on page 2 and item E on page 8 dealing with Ak Chin farming techniques.

See #10B in Letter 1.

5 - Footnote about water quality.

Well water would be tested before it is used for irrigation or for free-standing water. Poor quality water will not be used.

6 - D - utility and appropriateness of artificial water sources.

Sonoran pronghorn use of and need for free-standing water is poorly understood, largely because their environment offers little opportunity to use it and even less opportunity for people to study that use. It is apparent that some pronghorn do not use free-standing water for months at a time. It is also known that pronghorn drink regularly from some sources of free standing water (e g , HE Hill). We believe that the consumption of free-standing water increases the fitness level of those individuals who utilize it, and this hypothesis is well documented in the literature in relation to the American subspecies of pronghorn. We hope this study will add to that scant knowledge. See also #'s 11 and 29 in Letter 1.

7 - D - “fundamental question of whether the manipulation of the environment is acceptable.”

As stated many times before by Defenders, the Endangered Species Act specifies that agencies must do everything in their power to recover federally listed species. There should be no question that manipulation of the environment is wholly appropriate in endangered species issues. See also #'s 12 and 13 in Letter 1.

8 - “The tone of the DEA suggests that the agencies believe that this project is the only legitimate means of recovering the population” and “to infer that this action is the last and only hope for recovery is misleading and demonstrates the agencies’ unwillingness to examine their own actions.”

While this project is not the only legitimate means of recovering the pronghorn, it is the only action under consideration for this Environmental Assessment. If this project or some form of it is not enacted, an opportunity to effect positive change will likely be lost (“foregone”). See #9 below. See also #13 in Letter 1.

9 - Other agency activities such as cattle grazing, military actions, road construction, speed limits on SR 85 should be modified, AND Item D on page 8 of Defenders letter (land-use

management).

This Environmental Assessment deals only with one aspect of Sonoran pronghorn recovery efforts, the proposed action. It is not the purpose or intent of this Environmental Assessment to analyze every possible action that could be enacted for Sonoran pronghorn. The other mentioned projects and processes are outside the scope of this proposed action and Environmental Assessment.

10 - "All of the agencies which have jurisdiction over human use of the range should establish additional restrictions on when, where, and how the public can use the range."

This is already the case for the majority of Sonoran pronghorn habitat, as the Air Force side of the range is closed to nearly all public access west of SR 85. While this *may* be something agencies could consider, it is beyond the scope of this Proposed Action and Environmental Assessment. See #9 above.

11 - "Indeed, the Air Force Biological Opinion which first contemplates the enhancement of forage production through supplemental watering calls for a test plot outside of pronghorn habitat."

The June 12, 1997, Biological Opinion (quoted in this comment) was a preliminary Opinion. The final Opinion, dated August 27, 1997, states "the USAF will begin a pilot study determine if supplemental watering of test plots will increase the amount and length of time forbs are present and if Sonoran pronghorn will be **attracted to and use these areas**" (emphasis added) (Reasonable and Prudent Measure No. 3-4.). See also #'s 1 and 14 in Letter 1.

12 - Details on plot construction...informed and substantive public comment.

Details on plot construction and a general schedule have been added to the revised EA. See also #1 of this letter.

13 - Criteria for continuing/terminating the study

See #'s 10H and 26 in Letter 1.

14 - "The DEA fails to disclose the existing density of creosote on each plot and what amount of creosote will be destroyed within each area."

This level of detail is not required by the decision-maker to make an informed decision. Creosote is perhaps the most common plant in the Sonoran desert. This topic is sufficiently described in both the Proposed Action and Environmental Impacts section.

15 - Seeding discussion.

See #'s 5 and 8 in Letter 1.

16 - Range of alternatives and Suggested Alternatives.

See #'s 9 and 10 in Letter 1.

(A) - Creosote Burning.

This has been analyzed and added to the Alternatives Considered but Rejected section. See this section of the EA for reasons. See also #6 in Letter 1.

(B) - Forage Plots without Water.

This was in the draft EA and remains in the Alternatives Considered but Rejected section. See this section of the EA for reasons. See #'s 6, 9 and 11 in Letter 1. See also #6 in this letter.

(C) - Artificial Feed.

This suggestion has been analyzed and added to the Alternatives Considered but Rejected section. See this section of the EA for reasons. See also #19 in Letter 1.

(D) - Land-Use Management.

This has been discussed in previous comments See #'s 8, 9, and 10 in this letter.

(E) - Traditional Methods.

This has been discussed in previous comments. See #5 in this letter, 10B in Letter 1.

(F) - Cholla Planting.

This suggestion has been analyzed and added to the Alternatives Considered but Rejected section.

17 - Predation.

The predator discussion has been expanded in the revised EA.

18 - Disease.

The disease discussion has been expanded in the revised EA.

19 - Footnote 3 on page 10

See #18 in Letter 1.

20 - Disturbance.

While it is true that some disturbance is possible, this will be minimized. The expected benefits of the proposed action greatly outweigh the possible risks of disturbance to the pronghorn. Pronghorn using the forage plots will be healthy and hydrated, reducing the negative effects of any disturbance. Initial construction of the wells and creosote burning is scheduled for the summer and fall, after the pronghorn birthing season. See #10C, D, & E, and #14 in Letter 1.

21 - Pronghorn Distribution.

The Proposed Action is anticipated to alter the short-term movements and habitat use of some Sonoran pronghorn, while the forage plots are green, but will not affect the overall distribution of pronghorn. If favorable habitat conditions exist near HE Hill or other areas on the Tactical Ranges, some pronghorn may still use these areas. See also #19 in Letter 1.

Competition with desert mule deer, and desert bighorn sheep issues have been added to the Environmental Consequences (Wildlife) section of the revised EA. Detrimental effects to pronghorn from legal mule deer or bighorn hunting are not anticipated. See also # 21 in Letter 4.

22 - Precedent.

See #13 in Letter 1. The establishment of critical habitat or conservation agreements are

tools that can still be used in the future if necessary.

23 - Desert Ecology.

The plots will mimic the ephemeral bloom of wet years . These plots will not upset or alter the ecology of the Sonoran desert. They are site-specific, manipulated plots with discrete impacts totaling <2000 acres over 10 plots, inside portions of the 2,000,000 acre distribution of Sonoran pronghorn. To attribute significant negative changes in floral or faunal composition from this study is unfounded. See also #'s 4 and 12 in Letter 1.

24 - Soils.

The anticipated effect on soils is described in the Environmental Consequences section of the revised EA. Minimal loss of some cryptobiotic soils is anticipated during some phases of the proposed action; over time, it will regrow. We do not anticipate soil erosion from this loss due to increased vegetative growth on the plots and the relatively level plane of the plots.

25 - Cumulative Impacts.

The Cumulative Impact analysis has been expanded in the revised EA. See also #14 in Letter 1

26 - "the need to radio-collar additional pronghorn in their cumulative impact analysis."

This concern has been added to the Cumulative Impacts section. The U.S. Fish and Wildlife Service has permitted the AGFD to radio-collar up to 10 percent of the adult population. There are no plans to exceed this 10 percent level to aid in monitoring the study.

LETTER 3 - FRIENDS OF CABEZA

These responses also apply to an additional letter also submitted by Bill Broyles, which has the same comments in different order.

1 - "...we think it best to farm for Sonoran pronghorn starting with a 2 acre plot instead of 2500 acres."

See #1 in Letter 1.

2 - "Where have such plots worked?"

See #3 in Letter 1. This same general technique is currently being used successfully in Baja California, Mexico, with the endangered peninsular pronghorn.

3 - "...this project will cause irreparable harm to an extensive region of fairly pristine desert."

See #'s 4 and 5 in Letter 1. We repeatedly attempted to contact Dr. Richard Felger (quoted in this comment) but despite numerous phone and email messages at his home and office, he did not return the calls.

4 - "What plant species are you promoting?"

Commercial seeding has been dropped from the Proposed Action. See #8 in Letter 1. The

proposed project is to germinate and maintain the species of plants that are already present in the project areas.

5 - "What percentage of the pronghorn's diet do these species comprise?"

A large variety of herbaceous forbs make up the majority of pronghorn diet, when these plants are available. The relative percentage of individual species of plants is not that important, in that green forage is preferable over scarce, dry forage.

6 - Seeding questions.

The Proposed Action of the Environmental Assessment has been revised to include additional details. A seed drill was never proposed in the draft EA. See also #7 in Letter 1.

7 - "What plants do pronghorn fawns traditionally rely on during the dry/hot time between weaning and the summer monsoons?"

As in other times of the year, pronghorn, including newly-weaned fawns, select the most palatable forage available.

8 - "How long did the effect of a 2-inch watering last in a desert environment?"

The Tevis (1958) study is background and will not be repeated with this study. The 2-inch rain was applied twice to dying plants and most completely revived and resumed growing. As stated in the EA, with adequate water, some plants can "perennate" and live for 2 years.

9 - E, F, and G - Seeding questions

No commercial seeding is proposed. The Proposed Action of the Environmental Assessment has been revised to include additional details.

10 - "gardener talk."

The revised EA has been modified to reflect the expert opinion of several horticulturists.

11 - "...reasons why some places seem to be preferred feeding grounds for pronghorns..."

Based on the best available research, the availability of a combination of nutritious forage, open space, and water combine to create favorable conditions for pronghorn. This is what is proposed to be provided under the Proposed Action.

12 - 3(A) - Costs.

The budget for the project is addressed under the Proposed Action in the Environmental Assessment.

13 - 3(B) - Schedule.

The anticipated watering schedule is addressed under the Proposed Action in the Environmental Assessment.

14 - 3(C) - Seed availability.

See #'s 5 and 8 in Letter 1.

15 - 3(D) - Yields.

We expect the plants in the seedbank to germinate, just as if it had rained. See also #6 in Letter 1.

16 - 3(E) - Fertilizers.

Fertilizer is not a part of the Proposed Action.

17 - 3(F) - Hours and staff budgeted.

The description of the personnel involved and the hours are beyond the scope of the Environmental Assessment.

18 - 4(A and B) - test plot.

See #1 in Letter 1.

19 - 4 (C) - cholla.

See # 16F in Letter 2.

20 - 4 (D) - Ak Chin farming.

See # 16E in Letter 2.

21 - 4(E) - “Why wouldn’t you keep them viable all year?”

The Proposed Action is targeting fawn survival at a specific time of the year. Operating the plots year round would be unnecessarily expensive without any benefits to fawn recruitment.

22 - 4(F) - “The options should be more incremental.”

See #1 in Letter 1.

23 - 4(G) - “The options should include shutting down the entire Range to military ground or air-to-ground activity. Another option should be to move these TAC Ranges out of pronghorn habitat.”

These do not relate to the Proposed Action. See also #'s 8, 9, and 10 in Letter 2.

24 - 4(H) - “lunch wagon.”

See #16C in Letter 2.

25 - 5(A), (B), (C), (E), (G), & (I) - Monitoring/Success/Results.

See #'s 6 and 26 in Letter 1. Also see Appendix A of the EA.

26 - 5(D) - “What methods will you use to determine the effects of this project on other ecosystem components such as small mammals, rabbits, and birds?”

These will not be investigated. Due to the minimal amount of area this project entails and the temporary nature of the project, effects on small mammals, rabbits, and birds are believed to be minimal. The amount of human disturbance to do this level of monitoring would be counter-productive to the objective of increasing fawn recruitment. See also discussion under

Environmental Impacts: Wildlife in the revised EA.

27 - 5 (F) Predator control.

This issue has been added to the Environmental Impacts. Wildlife section of the EA.

28 - 5(H), (J) & (R) - Disturbance questions.

The effects are outlined under Environmental Consequences in the EA. See also #'s 10 in Letter 1 and 20 in Letter 2.

29 - 5(K) & (N) - "We fail to see what problem creosote causes."

This is explained in Habitat Manipulations: Creosote Removal of the Environmental Assessment. Creating a more open environment around the irrigated areas will attract pronghorn to these areas. During a drought year, creosotes will not provide sufficient annual plant growth acting as a "nurse plant" to sustain fawn survival. Consequently, during those years when we expect benefits to be derived from the Proposed Action, there will be plenty of forage due to the irrigation

30 - 5(L) - Plot size.

The correct acreages are in the revised EA

31 - 5(M) & (O) - Water application.

The Proposed Action includes lightly sprinkling water, using a sprinkler system from wells or a water truck, to reduce runoff, and avoid washing out of seeds/seedlings

32 - 5(P) - Sonoran pronghorn information.

The Affected Environment and Introduction adequately explain pronghorn dynamics enough to make an informed decision. See also #9 in Letter 5. A detailed history lesson or life history is not relevant to the Environmental Assessment.

33 - 5(Q) - "How does this proposal fit into the other activities in the habitat?"

This information is discussed throughout the Environmental Assessment and in the Cumulative Impacts section. See #14 in Letter 1 (in regards to cumulative impacts), #'s 10 through 18 in Letter 1 (in regards to the need for an EIS) and #'s 8, 9, and 10 in Letter 2 (in regards to this action in the overall strategy for survival and recovery).

34 - 6(A) - Section 7 / Native American consultations.

Section 7 consultation was completed and resulted in the 1997 Biological Opinion. This project implements Reasonable and Prudent Measure Number 3 of that BO; therefore no further Section 7 consultation is required (Mike Coffeen, USFWS, pers comm.).

Native American consultations have begun and will be completed prior a decision being made.

35 - 6(B) - "Why is this EA being written by BLM and the project run by Arizona Game and Fish?"

This project is a multi-agency effort. The EA was prepared by individuals from several agencies (BLM, LAFB, AGFD). The Air Force, the major funding source, contracted the Arizona

Game and Fish to carry out the work.

36 - 6(C) - "...we hear rumors that this deal was done prior to the start of the public comment let alone the conclusion."

The project was initially designed by the Core Working Group/Recovery Team. Public participation was first sought in February 1999, at a Recovery/Implementation Team Meeting. Although specifically invited, Friends of Cabeza declined to participate. Public meetings were held in Tucson and Yuma in February 2000; again, Friends of Cabeza did not attend.

LETTER 4 - SOUTHWEST NATURAL RESOURCE MANAGEMENT CONSULTANTS (SWNMRC).

Two letters, exactly the same, by the same author, were submitted, these responses apply to both letters.

1 - "...disturbance ...the Proposed Action may cause the SP to vacate these areas."

On-site work (with the possible exception of irrigation) will not be done when pronghorn are likely to be using the area. See also #'s 10D, E and F, 25 in Letter 1; and # 20 in Letter 2.

2 - "...the behavior of these animals becomes effected (*sic*) by the addition of the plots...not exploring and exploiting their entire range...becoming increasingly sedentary and thus increasingly dependent on these plots."

See #19 in Letter 1.

3 - "That coyotes ...(in) packs became more successful..."

The predator discussion has been expanded in the revised EA, see also #17 in Letter 2. Pack formation was not observed at HE Hill, under these same conditions. With the possible increase in small prey (rodents, hares etc.) coyotes are less likely to hunt in packs.

4 - "magnitude."

See #4 in Letter 1. Also #2 in Letter 5.

5 - "sense of urgency/age structure" and "45 new individuals recruited" in 1995.

Population and recruitment data are detailed in Hervert et al. 2000. See also #2 in Letter 5. The 1998 Recovery Plan states that "Sonoran pronghorn recruitment (survival of fawns) was 45 fawns per 100 does as of **June 26, 1995**" (emphasis added). This date is prior to the summer monsoon season, which came late and was almost 2 inches below normal that year. The final recruitment estimate for 1995 was 12 fawns per 100 does. This does not indicate a healthy, growing population. We can not "reasonably anticipate(d) that a wetter cycle is likely in the offing"; numerous long-range weather forecasts call for hotter, drier conditions for the next decade. Proactive measures are preferable to waiting for it to rain.

6 - "We recommend the Core Working Group evaluate the rate of mortalities associated with

the Mexico captures in 1991 and 1996 to better determine if future capture efforts for purposes other than transplants are desirable.”

Mortalities associated with captures in Mexico are beyond the scope of this EA.

7 - “The EA should provide the reviewer with the population estimate that has been identified that will then allow us to actually capture and translocate SP to their historic range.”

See #17 in Letter 1.

8 - “The EA presents an inadequate range of alternatives.”

See #9 in Letter 1. See also discussions of #16 in Letter 2.

9 - “The EA ought to provide a cost estimate and the intended funding source(s) for this project so that a rudimentary cost/benefit ration can be established.”

See #12 in Letter 3.

10 - “...we challenge the rejection of the Free Water Alternative...”

See #6 in Letter 1. It remains as an Alternative Considered but Rejected. In years with little winter rainfall, fawns die early...even in May. This is prior to the high summer temperatures and leads us to conclude that water is not the main concern at this time. A lack of nutritious forage from low winter rainfall is more important at this time; perennials exist, but may not supply enough nutrition for growing fawns. This is why we are proposing both forage and water, to cover all bases.

11 - “We reject 14 sites as excessive.”

The Proposed Action has been simplified and reduced to 10 sites. See #10 above also.

12 - “We suggest these hypotheses are inappropriate for evaluating the effects of the Proposed Action or Alternative B.” AND “Treatments ought to be tested individually...”

The single treatment being tested is the combination of forage, water, and open space. Individual testing of treatments would require substantially more plots. In addition, low numbers of pronghorn available as test subjects reduces the validity of this approach. Also see #6 in Letter 1.

13 - “There isn’t adequate justification for the acreage given.”

Plot sizes were based on the size of preferred disturbed areas on the Tactical Range. They were chosen to be attractive to Sonoran pronghorn, provide actual benefit (green forage), and be feasible to create and manage.

14 - “The expected time period to complete the Proposed Action should be provided.”

See #10H in Letter 1.

15 - “We disagree with the concept of implementing plots in areas that SP are currently using.”

See #'s 15, 25 in Letter 1, #20 in Letter 2. Creosote burning, well drilling, etc. will not take place when pronghorn are in the area. See also #1 in this letter.

16 - “This and other discussions in paragraph 5 regarding irrigation do not sound practical.”

We have modified the proposed action to include drilling three wells, greatly reducing the

number of water truck trips required. The EA has been revised to include a watering schedule based on expert horticulturist opinion. See #'s 7 and 10D & F in Letter 1.

17 - Seeding questions.

See #'s 5 and 8 in Letter 1.

18 - "...you should actively see(k?) (sic) additional review of this proposal by biologists and other disciplines and/or experience."

We have corroborated our technique with outside plant/desert/water specialists as well as incorporated comments, ideas, and alternatives from public comment letters from interested publics and biologists.

19 - "...a more realistic approach to increasing the SP nutritional intake would be to contract a local farmer to produce and harvest the desired forage and have the convoy of trucks deliver it..."

See #16 C in Letter 2.

20 - "The (water) development design should not intentionally build in periodic water hauling requirements."

We feel the design in the Proposed Action will not place repeated demands (in the same year/season) on hauling water and that it is easily and affordably installed. The fiberglass ring tank proposed in this comment is not designed to be buried.

21 - "We recommend against the regulating of water availability."

The water requirements of pronghorn are less than that of mule deer; our proposal tailors the availability of water to the needs of pronghorn. The purpose of regulating the water is to avoid mule deer becoming established in the vicinity of the plots. Mule deer will have moved closer to other water sources prior to these waters being turned on; therefore, mule deer will not be affected when these waters are turned off. Pronghorn will not be affected when the waters are turned off because they will have naturally dispersed due to summer rainfall before the water is turned off. Also see #2 in Letter 1.

22 - "We recommend the strategic placement of pronghorn decoys to attract SP close enough to see &/or smell the water."

This is not part of the proposed action. Pronghorn will be attracted to these areas by the combination of openness, forage, and water.

23 - "We prefer Alternative B... though we note the Goldwater Range Renewal LEIS (page 3-163) describes the groundwater on the range has been found to be of poor quality."

Wells have been incorporated into the proposed action, thereby reducing water hauling trips. Also see #5 in Letter 2.

24 - "We disagree (that opportunities to recover the SP would be foregone)"

The No Action Alternative has been modified to reflect this comment. See also #17 in Letter 1.

25 - Predator control.

This has been added to the Environmental Impacts. Wildlife section of the EA.

26 - "It appears to us that the obvious cost-effective solution to undesired SP exploitation of high risk areas such as HE Hill is to merely fence them out of these areas."

This is not related to the Proposed Action. Exclusion from the disturbed sites in the TAC ranges would likely be a negative impact to Sonoran pronghorn in that they choose to use these areas and suffer no (attributable) negative consequences. Also see #'s 8, 9 and 10 in Letter 2

27 - "We recommend the (B)ureau fully explore the concept of utilizing local contractors before committing substantial resources to this project. We know a project of this magnitude cannot be handled with current AGFD Development branch resources, particularly at that time of year when they are typically hauling water to numerous locales in Arizona."

The Proposed Action has been modified. Most of its needed actions are feasible within the resources of the Recovery Team agencies. Contractors will be used when necessary (i.e. drilling wells).

LETTER 5 - JON M. SHUMAKER

1 - "Is it only within the Goldwater Range the need for improved habitat has been identified?"

No. The need for improved habitat has been identified within the Cabeza Prieta National Wildlife Refuge also. However, due to wilderness restrictions within the majority of the Refuge (even within the non-wilderness portion), the Goldwater Range is the best place for the proposed project and it comprises a large part of Sonoran pronghorn range.

2 - "The numbers here indicate a rising population." AND "What are the natural population fluctuations in this area for this group over time"

In the last 5 years, there has been a precipitous drop in the population numbers. Only the recent (1990's) surveys have been performed systematically by air, therefore there is not enough years of data to show fluctuations over the long term. Recruitment estimates for the past 5 years have shown little to no recruitment, leading to an aging population. Pronghorn only live about 8-10 years in the wild and productivity decreases later in life. With such low numbers of an aging pronghorn population, small variations in population numbers do not show the urgency of the situation.

3 - "I disagree with 'Large home ranges suggest an overall low habitat quality' - it is an imposition of human values on population dynamics."

Whether you personally agree or disagree with this statement is not an issue in this EA. It is not an opinion nor an imposition of values on anything. It is a statement, backed up by facts, made by the author, as cited in the EA.

4 - "...aggressive management to lessen the effects of human activity on Sonoran pronghorn range is necessary.' So why not Air Force and Marine Corps departure, road closing, redo

fencing, etc.”

This sentence was taken out of context. It was in reference to the combined effects of human impacts over time - not particular to the current situation on the Goldwater Range. There is no data to suggest that closing roads, redoing the minimal fencing, or that the departure of the military would have any effect (positive or negative) on Sonoran pronghorn. See also #'s 8, 9, and 10 in Letter 2.

5 - “Fawn survival is the most critical component of the population dynamics of Sonoran pronghorn.’ Wrong to apply value to a particular component of population dynamics.”

Stating that fawn survival is the most critical component of population dynamics does not entail applying values to anything. It is common sense, basic mathematics, and elementary principals of population dynamics. If fawns do not reach the reproductive stage there will be no more fawns produced. As adults die, even simply from old age, with no more fawns behind them, the population will drop to zero. This does not entail applying any values, other than that we value Sonoran pronghorn and do not want to see their extinction.

6 - “The key to recovery of this endangered subspecies is through recruitment of fawns into the population.’ Wrong. The key to recovery is restoration of range and habitat.”

The time required to “restore” Sonoran pronghorn range to an unknown condition will not address the urgency of the situation. Even with “restored” range and habitat, the KEY to recovery is the recruitment of fawns into the population. See #5 above, see also #5 in Letter 4.

7 - “the availability of preferred food items for pronghorn is dependent on the timing and amount of rainfall.’ This statement ignores the fact that pronghorn eat year-round, so there is a variety to their diet that probably fluctuates within seasonal parameters.”

The statement from the EA is true and embraces the obvious that there will be seasonal variety - yet pronghorn still have preferences year-round.

8 - “How long do fawns nurse, and does this vary with the availability of forage.”

Pronghorn fawns nurse for up to 3 months. Weaning will vary with the condition of both the fawn and the doe, which is largely dependant on forage conditions.

9 - “Where is the documentation for a statement about fawns dying without a productive monsoon?” AND “the discussion of habitat/vegetation change is not documented anywhere” AND “predators undoubtedly take fawns, (no citation, no data)”.

The Environmental Assessment is not a peer-reviewed research paper. Currently there are no requirements for Environmental Assessments to use citations for every assertion, observation, or conjecture. As stated throughout the EA, Hervert et al. 2000, the Final Revised Sonoran Pronghorn Recovery Plan (USFWS 1998), Hughes and Smith 1990, and Wright and Devos 1986 provide ample background information on Sonoran pronghorn life history. In addition, the preponderance of evidence in the vast body of literature in relation to *Antilocapra americana americana* does not dispute these assertions.

10 - “There is no data showing that human-provided free water is a boon, and there is no data showing that this is not actually harmful to pronghorn”, AND “the need has not been

determined” (in reference to Holiwill Tank), AND all other comments regarding Sonoran pronghorn and water developments.

See #'s 11 and 23 in Letter 1 and #6 in Letter 2.

11 - “Where exactly does the goal of 500 pronghorn come from in order to de-list them. Is this based on science?”

This was a typographical error in the draft EA. The revised EA states 300 adult pronghorn and comes from the Final Revised Sonoran Pronghorn Recovery Plan (USFWS 1998). This number was determined by the Recovery Team and is based on the best available science.

12. - “Pronghorn numbers appear to fluctuate...reference for this. What are the natural fluctuations for this population?”

See #2 and #9 in this letter.

13 - “‘Other factors, previously suspected... no longer considered significant.’ Why? What are all these factors? What about habitat fragmentation?”

The Introduction adequately discusses the travails of Sonoran pronghorn. The EA specifically mentions poaching as a factor not currently thought to significantly impact U.S. pronghorn.

Sonoran pronghorn currently have unrestricted access to over 2 million acres of land. Interstate 8, Highway 85, and Mexican Highway 2 now restrict movement to former historic habitat. Despite attempts to construct “pronghorn friendly” over and underpasses in other states, pronghorn do not use them. Short of removing these major highways, which is totally unrealistic, these pronghorn (until they are physically moved to other areas) are most likely confined to their current 2 million acre range. This project is an attempt to lessen the negative effects of habitat fragmentation, by increasing the quality of their current habitat.

14 - “The use of a hypothesis testing strategy seems to indicate that there really is no basis for this proposed action; that it is experimental and not based on actual data.”

This is an experiment/research. See the Proposed Action. See also #9 above. In the scientific process, you observe, make hypotheses, and then test your hypotheses with experiments. This same type of experiment is currently being undertaken with success in Mexico with the endangered peninsular pronghorn.

15 - “What guarantee of continuity is there” AND “Where is Fish and Wildlife and why aren’t they adopting this strategy on their lands” AND “...yet the Air Force and the Marine Corps don’t seem to be involved.” AND “Why aren’t the Marines offering funding for a project on their lands?” AND “Forage enhancement improvements may be considered in the future on the refuge? According to who? Does Fish and Wildlife really sanction this action as an effective means (*sic*) to recover pronghorn?”

A project of this nature is required by the Air Force’s Biological Opinion (see #11 in Letter 2), therefore it will continue for the proposed time span (see #10H in Letter 1). Cabeza Prieta NWR is undergoing land-use planning (development of the CCP) and would not permit any new activities on the refuge prior to the plan. Should the research validate the strategy it is hoped that it can be applied throughout the current range of the pronghorn. Also see #35 in Letter 3 and #26 in Letter 1.

16 - Soils questions.

In addition to Tevis (1958), aerial observations of the “natural experiments” on the Tactical Ranges provide the basis for attempting the technique on sandy soils. “Heavier soils” are those with an increasing clay component. No soil scientists have been contacted, but see #3 in Letter 1 (as well as the revised Proposed Action).

17 - Size questions.

See #4 and #1 in Letter 1. Also # 13 in Letter 4.

18 - “It is stated that parcels will be following along existing roads-this seems to be flawed in that the proximity to roads is a variable not controlled for in the experimental design.” AND “It is implied that not all of these plots are or will be near areas that pronghorn use. Then why are they being utilized?”

See #'s 25 & 6 in Letter 1. The plots are all in areas that pronghorn currently use or pass through in their seasonal movements.

19 - “additional populations” and “restoration of habitat” questions.

“(I)ntroduction of pronghorn into historic habitat” is in reference to areas considered historic habitat that are NOT currently occupied. See #17 in Letter 1; #'s 8, 9, and 10 in Letter 2; #23 in Letter 3; and #'s 4, 6, and 13 in this letter.

20 - “Also how long until the efforts are judged effective/ What is considered a reasonable length of time?”

See #'s 10H and 26 in Letter 1.

21 - Site characteristics questions.

See revised Proposed Action and #28 in Letter 1. Rain gauges will be placed at each plot.

22 - “What kind of propane torch?”

See revised Proposed Action.

23 - “...what research shows “reduce plant competition” and “allow additional forb production?”

See #23 in Letter 2, # 29 in Letter 3, #18 in Letter 4, # 9 in this letter.

24 - “no creosote bushes would be removed within a one to five-acre ‘area’ of cultural resources. What is this based on?”

An archeologist will determine the size of a buffer area around any cultural resources, see revised EA.

25 - Native American consultation questions

See #34 in Letter 3.

26 - Questions about creosote revegetation and “How do you know these areas won’t simply

become superhighways for the invasion of exotic invasive plant species, especially because a number of these plots are along roads”. AND “This project needs to prove beyond a doubt that the invasive alien species situation will not be exacerbated by this proposed undertaking, BEFORE the undertaking occurs”.

There are no plans to revegetate or restore previous densities of creosote on the plots. The intuitive thinking is that they will remain areas of higher use/value to pronghorn (like the natural experiments on the Tactical Ranges) after the study. See also #'s 4, 5, and 10G in Letter 1 See also #23 in Letter 2.

27 - “the idea of watering the desert... remains controversial” AND “The literature does not indicate that what is being planned here will actually work”. “And the reference Forsyth et al 1984 isn’t even in the bibliography.”

See #'s 3, 11 and 13 in Letter 1 and #23 in Letter 2. The reference has been added, see under Forseth.

28 - “Water would be applied frequently enough to enhance forage production goals of each plot.” And this would be how much?”

See #'s 6, 7, and 10H in Letter 1 and #13 in Letter 3.

29 - Water truck and disturbance questions and water quality questions.

See #10D, 10F, 27 in Letter 1; #5 in Letter 2. See also #16 in Letter 4.

30 - Seed questions.

See #'s 5, 8 and 10G in Letter 1.

31 - Drip Irrigation.

Drip Irrigation has been dropped from the Proposed Action. see revised Proposed Action.

32 - Traditional Tohono O’odham farming techniques

See #10B in Letter 1; #5 in Letter 2, and #20 in Letter 3.

33 - Questions about water for pronghorn.

See #11, 23, 29 in Letter 1; # 6 in Letter 2; and #'s 9 and 14 in this Letter.

34 - Native American consultations.

See #34 in Letter 3.

35 - “Regarding your staging/camping areas, these too must be checked for cultural resources and cleared by a qualified archeologist.”

Appropriate cultural clearances will take place prior to any activities.

36 - “why aren’t the Marines offering funding for a project on their lands?”

The Marines have contributed significant amounts of money for preliminary pronghorn studies. They may contribute more in the future.

37 - Drilling wells, water quality, “inappropriate to drill wells in an area of National Park

quality.”

See #29 in this letter. Determining that an active, well-roaded military bombing range, littered with tow darts and unexploded ordnance is an area of “National Park quality” is subject to opinion. Until it is actually designated a National Park by Congress, it is not a National Park and should not be managed as if it were. Even in the unlikely event it became a National Park in the future, that designation would not preclude endangered species recovery.

38 - “...there should be a single test plot outside of pronghorn habitat to work out whether or not this project is even feasible.”

See #'s 1 and 3 in Letter 1.

39 - “Complete soil, vegetation, and wildlife profiles need to be done prior to any project of this nature in order to establish a baseline for measuring changes and impacts, whether positive or negative.”

See #'s 14, 23, and 24 in Letter 2 and #26 in Letter 3.

40 - ACEC questions.

The establishment of the plots is consistent with the ACEC goals. Manipulations within specially designated areas (like ACECs or wilderness) are completely acceptable and understandable in the right circumstances.

41 - Water diagram.

See revised EA.

42 - “...perhaps the impacts (of water systems) would be lessened if they were left above ground rather than buried.”

Burying the drinking systems seems to be the safest and most reliable method of guaranteeing water delivery for the life of the study. The irrigation systems will be (removable) above-ground piping systems.

42 - “move the herd out of ...the way of the Air Force”.

As stated in the Recovery Plan’s goals and objectives, establishing another viable pronghorn herd within its historic habitat is one of the ultimate goals of this project. There is no attempt to move the pronghorn out of the way of the Air Force.

43 - “You note that recreational use is expected to gradually increase. This would be something that can be addressed without destroying more pronghorn habitat as in the proposed action.”

Dealing with increasing recreational use is something that should be evaluated, however, it is not part of, or related to, this EA. See also #'s 8, 9, and 10 in Letter 2.

44 - “‘Irreversible and...?’ You have not documented this. Some of these changes have the potential to be damaging and irreversible.”

The subject matter pertains to NEPA and the commitment of time, money, and manpower resources toward the project. All assets going into this project (except water) are retrievable, such

that their impact/presence can be essentially removed after the completion of the project (if desired)
See also #4 in Letter 1.

LETTER 6 - TOHONO O'ODHAM NATION NATURAL RESOURCES DEPARTMENT

1 - Purpose and Need questions.

The Environmental Assessment has been revised to reflect these suggestions

2 - "...stated that the project was initiated (at least in part) in response to the terms and conditions of a U.S. Fish & Wildlife Service Biological Opinion regarding military training on the BMR. There is no reference to this Biological Opinion in the EA."

See revised EA. Also see #14 in Letter 1 and #11 in Letter 2.

3 - "What happens if you cannot get permission from any water holders?"

See revised EA. Also see #27 in Letter 1.

4 - Native American consultation questions.

See #34 in Letter 3.

5 - "The re-establishment of native vegetation in areas impacted by construction of buried free-water systems could be facilitated by seeding the disturbed site with native forbs and planting potted perennial woody vegetation."

See #26 in Letter 5. See also #'s 5 and 8 in Letter 1.

6 - "It would be several years before we could expect any results from the proposed project. I suggest you contemplate some additional supplemental feeding programs... this season and until the proposed action has a chance to get off the ground."

The Proposed Action has chances of succeeding each and every year that it occurs. See also #16C in Letter 2.

LETTER 7 - YUMA COUNTY DEPARTMENT OF DEVELOPMENTAL SERVICES

1 - if pronghorn are drawn to cultivated areas they may become a nuisance to the farmers.

The possibilities of nuisance pronghorn in the cultivated fields should be easily addressed through fencing.

2 - Respiratory concerns

These are conditions inherent to this type of work. The workers will be informed of the job hazards and protective equipment will be provided.

3 - "The mortality of young antelope needs to be further investigated. Perhaps forensic investigation of the carcass for respiratory damage could be done."

Such research is problematic and difficult. There are not enough fawns to risk radio-collaring them to directly address this question. Even if they could be radio-collared, they are usually entirely

consumed by predators or scavengers such that necropsy is not possible. Recovery of fawn carcasses is a part of the telemetry monitoring, when possible.

LETTER 8 - J. P. MELCHIONNE

1 - **"I am concerned that following the experimental forage enhancement program, whole areas of the Goldwater Range will be added to the 'Wilderness Area' designations in Arizona,..followed by protective easements (*sic*) for the protected areas - with the final outcome being closing off the Goldwater range for military training."**

There is no designated wilderness in the current Goldwater Range withdrawal. There are no proposed restrictions on military activities subject to the Proposed Action or any of its alternatives. Closing the Goldwater Range to military activities due to this project is highly unlikely, especially in light that it was just renewed. See #31 in Letter 1; See also #37 in Letter 5.

LETTER 9 - BRIAN F. DOLAN

1 - **"The final EA should allow for implementation of forage enhancement on any portion of the Cabeza Prieta NWR as determined necessary by the Recovery Team." AND "I am similarly concerned that the Tactical Range alternative could not be pursued....It almost seems (*sic*) as though locations were determined on the basis of administrative convenience rather than where they would offer the most benefit..."**

The proposed plots will provide benefit to pronghorn. Working on the Cabeza Prieta and the Tactical Range are both listed as alternatives considered but rejected in the revised EA and reasons for not working there given. Neither of these areas have been ruled out for forage enhancements in the future, should they prove effective. Compromise is often necessary in order to accomplish anything worthwhile, and fighting for these two areas now would only delay the project.

LETTER 10 - MIKE SEIDMAN

1 - **"populations are higher than they were back in 1924" and questions about natural variation in an arid environment.**

See #2 in Letter 5 and #5 in Letter 4.

2 - **Questions about population in Mexico.**

In 1993 the population in Mexico was estimated to be 313 animals. However, this is one snapshot in time, with no indications of trends over time. The current population estimate is not known. Pronghorn in the past may have done better there due to better (wetter) habitat conditions. Maintaining corridors between the Mexican and US populations is not a recovery strategy at this time. Biologists in Mexico contend that poaching is still a problem and allowing more pronghorn into Mexico to be killed would be detrimental. Even if the border fence were removed to allow movement, Mexican Highway 2 would prevent US pronghorn from mixing with the Mexican population, which are all south of this highway. Regardless of the population size or status in

Mexico, Sonoran pronghorn in the United States are listed as endangered and the U S Fish and Wildlife Service is mandated under the Endangered Species Act to recover them.

3 - Fragmentation, obstacles to movement questions.

See #'s 13 and 6 in Letter 5.

4 - Questions about goal of 500 pronghorn.

See #11 in Letter 5.

5 - “pronghorn numbers have been decreasing all through the West, perhaps from drought... haven’t heard forage enhancements suggested elsewhere”

While this statement may be true in some areas of the West, it is referring to another subspecies of pronghorn and none of those other populations are endangered.

6 -Questions about the need for management and “animals have lived in the desert for thousands of years and adapted to aridity” and “the natural course of things in the desert.”

It is true that animals have lived in this desert for thousands of years and adapted. However, in the last 100 years, rapid changes have taken place such as vegetation changes from cattle grazing, construction of dams on the Gila River, introduction of diseases, construction of interstates and roads. more traffic, and faster cars on those roads etc. It is dangerous to assume that pronghorn could adapt to such changes in their desert environment as quickly, therefore, the need to manage populations to mitigate for human caused changes may be necessary. Also see #9 in Letter 5.

7 - “no proof that Sonoran pronghorn even need to drink water”

See #'s 11 and 23 in Letter 1, #6 in Letter 2, and # 9 in Letter 5.

8 - Questions about predators.

The discussion about predators has been expanded in the revised EA.

9 - Exotic plant issues.

See #5 and 10G in Letter 1.

10 - “commit to sustaining these practices into the far future...” and “...population completely dependent on people?”

See #'s 10H, 19 and 26 in Letter 1; #7 in Letter 2.

LETTER 11 - ARIZONA GAME AND FISH DEPARTMENT

No response needed.

LETTER 12 - DEPARTMENT OF THE AIR FORCE - HQ AETC/CEVN RANDOLPH, TEXAS

The comments in this letter were all editorial; all suggested changes were made to the EA.

LETTER 13 - WILLIAM D. SOMMERS IV

No response needed.

LETTER 14 - YUMA VALLEY ROD AND GUN CLUB

No response needed.

LETTER 15 - PEOPLE FOR THE USA

No response needed.